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Report No. 4

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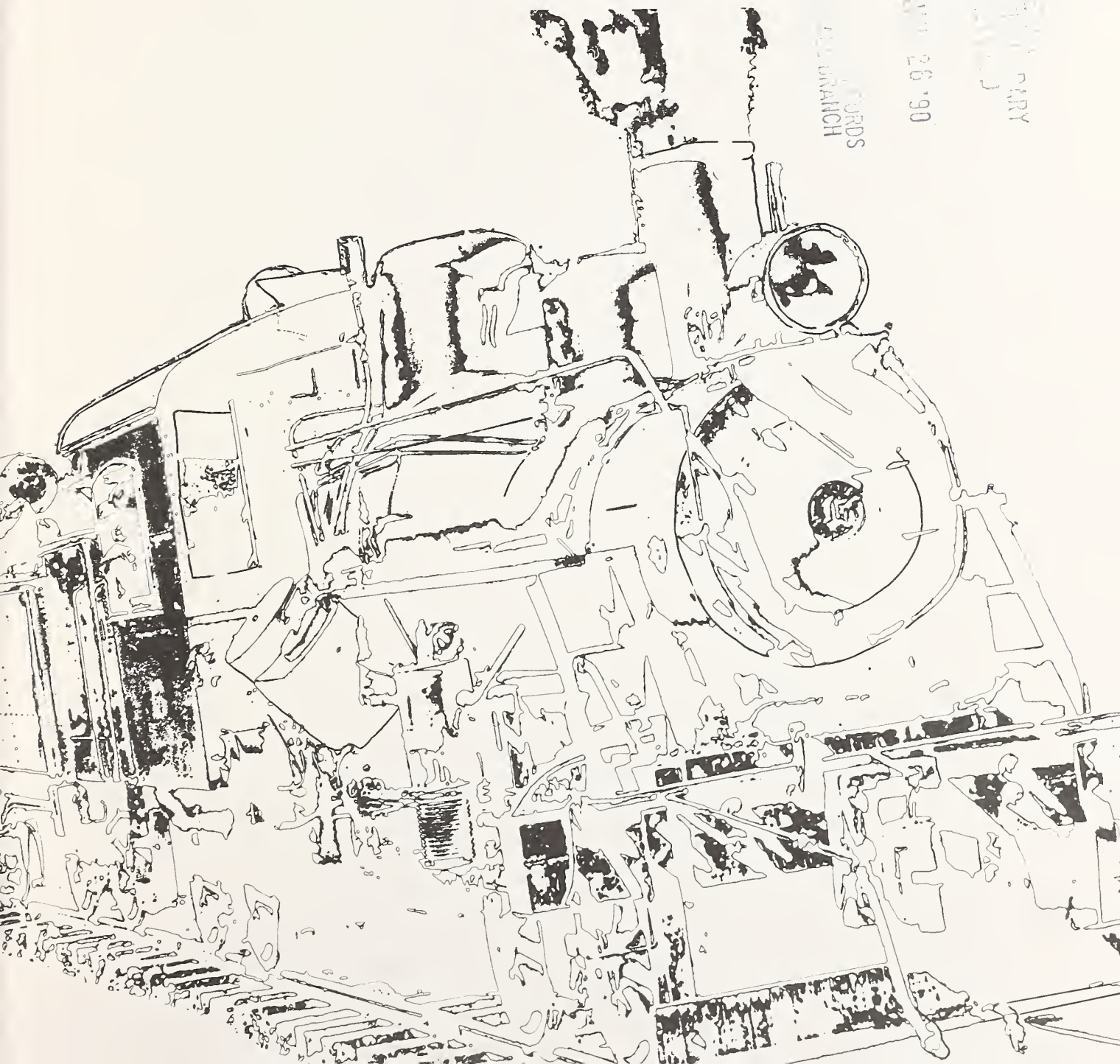


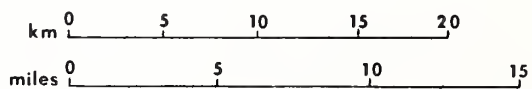
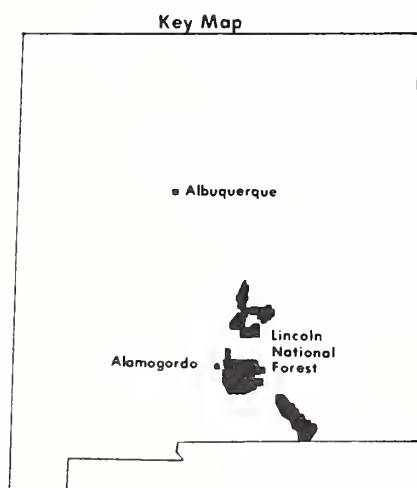
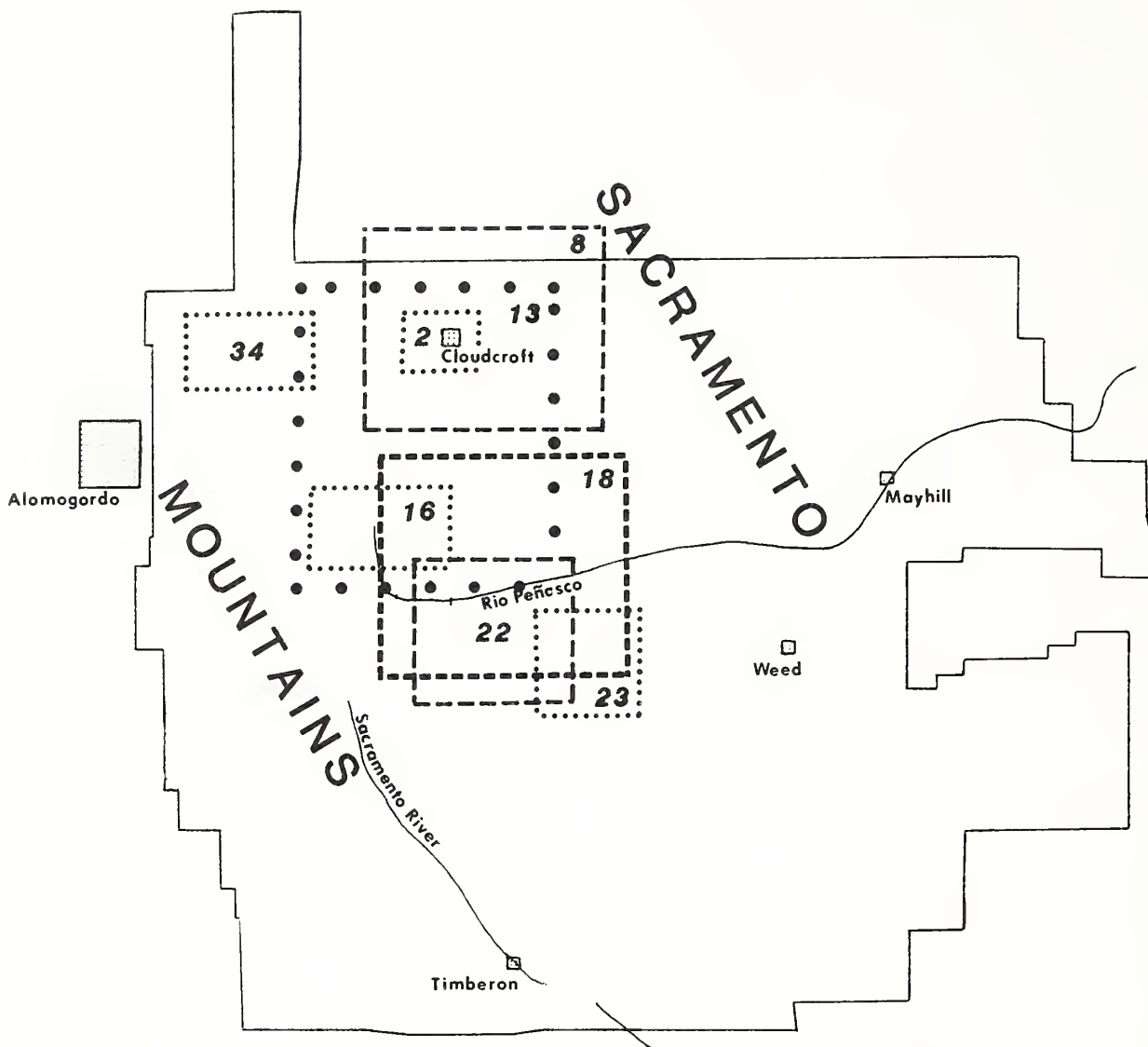
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Cultural Resources Management

Logging Railroads of the Lincoln National Forest, New Mexico

Vernon J. Glover





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Numbers refer to Figures in text.



Locational maps showing the Alamogordo vicinity and units of the Lincoln National Forest.

LOGGING RAILROADS OF THE LINCOLN NATIONAL FOREST, NEW MEXICO

By

Vernon J. Glover

CULTURAL RESOURCES MANAGEMENT

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USDA Forest Service
Southwestern Region

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HISTORIC OVERVIEW

Introduction

The age of the steam logging railroad in the Sacramento Mountains was very brief by most measures, barely over forty years. During that period, however, the railroads brought about many changes affecting the land and our view of it. For the first time, extensive mechanized logging took place over a large area. During the same period, the tourist and resort business was developed and vigorously promoted. The tourists came by the thousands, first by rail, then by road. The district's economy was transformed from one of frontier farming and ranching to one with a capital-intensive industrial base closely tied to regional and national trends. The evolution of the lumber industry left its own mark on the mountains in the form of rail beds, skidways, and campsites. Decades after their abandonment, these signs of human activity are, for the most part, forgotten and unknown to most of the present users of the National Forest.

The purpose of this study, which was requested by the Southwestern Region of the U.S. Forest Service, is to provide a description and history of the railroad logging industry that so profoundly affected the Sacramento Mountains. In addition, a general interpretation of the artifacts of the steam logging railroads is provided to aid those responsible for subsequent studies and surveys of the cultural resources within the Lincoln National Forest (see frontispiece for area map).

A large part of the construction of railroad lines into the area predates the formation of the National Forest. Information and records are scattered among numerous institutions and individuals. Gathering together the bits of data has been a labor of love on the part of several dedicated people rather than a project to be completed to a timetable. Nevertheless, the material presented here is a reasonably comprehensive picture of the business and engineering history of the logging railroads.

The history of the early lumbering industry in the Sacramento Mountains is inextricably involved with that of the main line railroads of southern New Mexico and west Texas, especially the companies that made up the Southern Pacific lines. The key element of the relationship was the timber itself. Railroad

construction required immense quantities of timber for crossties, trestles, buildings and structures such as culverts, water tanks and cooling chutes. The ongoing maintenance and upkeep of these facilities required significant quantities of timber on a continuing basis. In addition to the railroads, mining companies in the region used timber extensively for underground supports and for material-handling structures both above and below the surface. The mining market was very competitive and the miners' requirements were often filled by timber shipped in from as far away as Oregon. This added considerably to the risk of the lumber and timber trade in the southwest.

In the days of railroad expansion in the southwest it was the practice of the men building the railroads to become involved in mining and other related enterprises to provide some traffic for the railroads. Often, too, mining men would build railroads to gain access to their markets and to reduce their shipping costs. All of these relationships, reflecting regional and even national conditions, had considerable influence over the day-to-day affairs of otherwise locally managed enterprises. This was certainly true of the logging companies in the Sacramento Mountains (Neal 1966:1).

The Main Line

Plans to build a railroad to the Sacramento Mountains began almost with the arrival of the Santa Fe and the Southern Pacific main lines in El Paso, Texas, during the first half of 1881. A line called the El Paso and White Oaks Railroad was incorporated in New Mexico on February 28, 1882 (N. M. Corp. Commission n.d.). Little came of this enterprise and it was not until June 1888 that a more substantial attempt was made with the incorporation of the Kansas City, El Paso and Mexican Railroad (KCEP&M) (Engineering News 1889).

By December 1, the KCEP&M had completed ten miles of track, extending northward to a point called Lanoria, Texas, from a terminal in El Paso. Once more, interest in the project lagged, and construction trailed to a halt. Morris R. Locke, who was promoting the line, noted in his prospectus the potential value of the timber traffic to be drawn from the Sacramentos. It was important, but it was considered to be only a fraction of the revenues to

be gained through development of the coal and metal mines near White Oaks [Engineering News 1889].

It was not until 1896 that the ultimately successful El Paso and Northeastern Railroad (EP&NE) appeared on the scene. The first incorporated entity was the El Paso and Northeastern Railroad Company, incorporated in Texas on June 12, 1896. Its stated purpose was to build 19.22 miles of railroad from El Paso to the New Mexico boundary [Poor 1902:493]. This corporation was set up to comply with the Texas law requiring that all railroads operating in the state be headquartered in Texas.

Next to be incorporated was the New Mexico Railway and Coal Company (NMRy&CCo), in New Jersey on May 15, 1897. This was the overall holding company, controlling not only the railroads but the lumber and mining companies as well. And on October 21, 1897, the El Paso and Northeastern Railway was incorporated in New Mexico for the purpose of building a railroad from the Texas line to the Capitan coal fields [Poor 1902:493].

The promoter of the EP&NE lines was Charles Bishop Eddy, who had earlier developed the communities along the Pecos River in southeastern New Mexico. For the EP&NE venture, he obtained the very substantial backing of a group of capitalists from Scranton and Wilkes-Barre, Pennsylvania: H. M. Boies, Benjamin S. Harmon, John Wallas Hollenback, F. L. Peck, Charles D. Simpson, and others [Poor 1902:493]. These men acted in various roles in the increasingly complex structure of the NMRy&CCo. Before long numerous subsidiaries would be involved in branch line railroads, a new main line railroad, coal mining, and lumbering activities.

Construction of the EP&NE began in December 1897, working out of El Paso. Some 4.16 miles of the old KCEP&M route were used, then the line ran northeast directly toward the Sacramento Mountains. By June 15, 1898, the tracks had reached the site of the new town of Alamogordo. Located near a good spring at the foot of the mountains, the point was 86 miles from El Paso. Alamogordo was selected as the site of the main shops of the new railroad. It had the necessary water, it was near the junction of the planned logging railroad, and the land was under the control of the EP&NE backers [Neal 1966:5].

The EP&NE construction forces paused only briefly at Alamogordo. Within a matter of weeks, work had begun on the new logging road, the Alamogordo & Sacramento Mountain Railway, into the mountains. Within a few months work resumed on the main line toward Carrizozo and the coal mines near Capitan. The main line tracks reached Three Rivers on June 20, 1899, and Capitan on August 3. At Carrizozo the tracks swung eastward and began climbing toward Indian Divida, a pass between the White Mountains and the Vera Cruz Mountains. This came as a surprise to some who had assumed that the railroad was inevitably headed for the mining town of White Oaks. But the goal of the railroad was in fact its own coal mines, located on Seaborn T. Gray's ranch, just to the north of the future site of Capitan. The tracks reached the mines on October 1, 1899, and coal production began immediately [Myrick 1970:76].

It was not long until the limitations of the Capitan mines became painfully apparent. Cut and broken by volcanic intrusions and slate, the coal veins could not be efficiently worked to produce the amount of coal needed for the railroad and other customers. Eddy and his attorney, William Ashton Hawkins, were very much aware of the disaster facing their young enterprise, and a complex and somewhat bewildering series of events began to unfold. Eddy and Hawkins secured an option on the excellent coal under Dawson's ranch up on the Maxwell Grant in northern New Mexico [Kelahey 1962:291-293]. Then the Chicago, Rock Island and Pacific Railroad resumed construction of a long idle line extending west and south from Liberal, Kansas. For its part, the EP&NE commenced building an extension northward from Carrizozo under the name El Paso & Rock Island Railway. From a start on January 15, 1901, this line met the Rock Island at Santa Rosa, New Mexico, on February 1, 1902. This connection completed a through main line to Kansas City and St. Louis, opening those markets to the timber trade [Myrick 1970:76-77].

The EP&NE construction gangs didn't stop at Santa Rosa. They moved up to the raw new town of Tucumcari and built the Dawson Railway northward to the mines at Dawson's ranch. To speed the opening of the mines, a second railroad was established through a connection with the Santa Fe Railway at Franch, New Mexico. The first coal shipment went out over this spur on May 23, 1902. The entire

Dawson line was opened for traffic on July 1, 1903. With the completion of the Dawson Railway, the expansion of the NMRY&CCo was completed (Myrick 1970:82).

During the same period, the copper interests of Phelps Dodge & Company had pushed their El Paso and Southwestern Railway (EP&SW) from Bisbee, Arizona, across southwestern New Mexico to El Paso, completing the line on November 19, 1902. The EP&SW not only connected the mines at Bisbee with the new smelter at Douglas, Arizona, but it provided connections to a number of other railroads to avoid dependence on one hauler. Given their need for coal and timber, as well as an interest in competitive transportation it was not surprising when, on July 1, 1905, Phelps Dodge purchased the entire property of the NMRY&CCo. The railroad properties, including the mountain branch, were immediately merged with the EP&SW for operation under a single management (Myrick 1970:88-89).

Although the EP&SW was a financial success, it was essentially an industrial feeder line dependent on its connections with the Southern Pacific and the Rock Island for profitable through traffic. Ultimately, Phelps Dodge decided to concentrate on copper production, and sold its interest in the EP&SW to the Southern Pacific (SP) on November 1, 1924. This ownership continued throughout the remaining life of railroad logging in the Sacramento Mountains (Myrick 1970:94).

Alamogordo and Sacramento Mountain Railway

As the EP&NE neared Alamogordo, its backers went to work to develop a timber industry in the nearby Sacramento Mountains. The Alamogordo Lumber Company was organized to purchase land, build a sawmill, and log in the mountains. The connecting link was to be the Alamogordo and Sacramento Mountain Railway (A&SM), incorporated in New Mexico on March 24, 1898. In the coming years, the A&SM would be the longest portion of the route traversed by logs on their way to the sawmills (Neal 1966:10).

Construction of the A&SM began in mid-1898, shortly after the main line arrived in Alamogordo. The first section of the A&SM was opened during November 1898. It extended from Alamogordo Junction (1.4 miles north of the Alamogordo depot) to a point in

upper Frasnal Canyon called Toboggan, 19.3 miles from the junction. The engineering of the route was a classic example of mountain railroad design. To make the climb from Alamogordo Junction at 4,372 feet elevation to Toboggan at 7,580 feet, the railroad was a nearly continuous series of sharp curves combined with steep grades. The normal curvature was a so-called 30 degree, or 193 foot radius, band. Grades exceeded five percent, with one half-mile stretch of over six percent peaking at a fair some six and one-half percent. The result was a standard gauge railroad that far exceeded the fabled Colorado narrow gauge roads in severity (Railroad Gazette 1902:466).

Such a railroad offered plenty of spectacular views to its passengers as it wound along the ridges. That proved to be one of its assets. The steep and sinuous track presented plenty of problems, too. Locomotives had to be specially designed and equipped to operate on the line. Brakes had to be efficient and well kept. Ultimately, log cars with dual brake systems became the norm. Wet and icy weather proved to be a regular and occasionally fatal hazard. But the A&SM had one advantage the narrow gauges could never match, and that was the ability to ship out and receive normal freight cars. The use of standard gauge track eliminated the damaging and very expensive car-to-car transfer required for many shipments to and from narrow gauge roads.

The opening of the A&SM to Toboggan was celebrated with elaborate Dedication Day ceremonies on November 18, 1898. Two trains were on the line that day, one a special passenger run and the other a short train of logs.

The A&SM rested, so to speak, at Toboggan for a time. The next portion of the line would be even more difficult and expensive to complete and a great deal of preparation would be required. It was not until early October 1899 that construction crews moved out to extend the railroad from Toboggan to Cloudcroft and Cox Canyon. It is likely that the first couple of miles of the line, including the famous switchback (Figura 1), were built initially as a logging spur of the Alamogordo Lumber Company to reach the timber in upper Bailley's Canyon.

The A&SM extension was only 7.5 miles in length, but

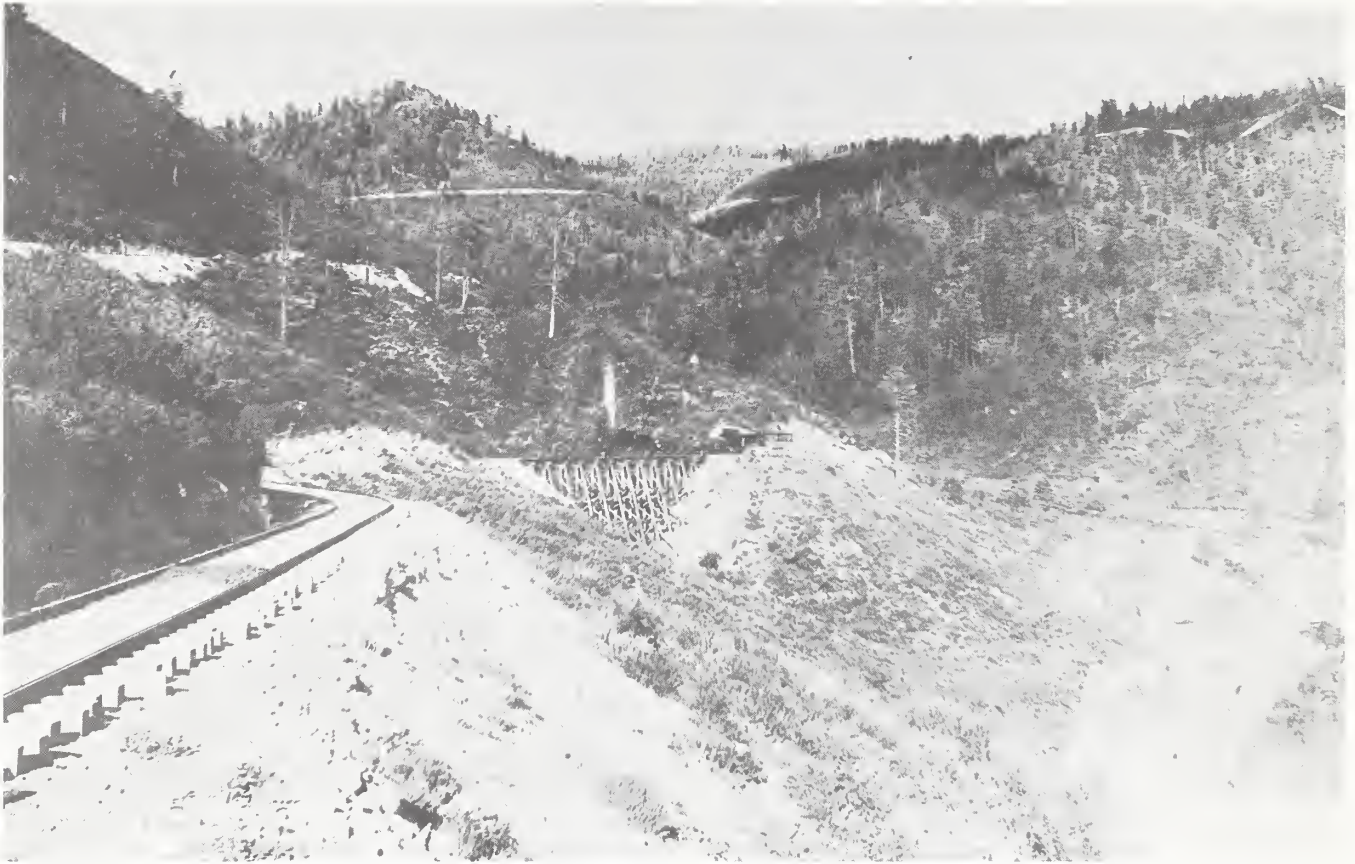


Figure 1. An interesting early view, ca. 1900, showing most of the railroad between Toboggan (lower left) and Cloudcroft. The short train is backing down the switchback after coming down from Cloudcroft.

it incorporated a rise of 2,000 feet, the usual 30 degree curves (193 foot radius), grades of 5.2 percent, and no fewer than 27 major timber trestles (Figure 2). The largest of these survive today in Bailey's Canyon, Mexican Canyon, and just below Cloudcroft (Figure 3). The last named is the famous S-trestle incorporating a double 30 degree curve in its 338 foot length (Figure 4). This structure is listed on both the New Mexico and National Registers of Historic Places. As many as 500 men worked on the line during the winter, grading, building trestles, and laying track. The railroad was completed to Cloudcroft on January 25, 1900, and to Cox Canyon during June (Alamogordo News 1899d, 1900a, 1900f).

As soon as the A&SM was in operation to Cox Canyon, a number of logging railroad spurs or "tramways" as they were sometimes called, were built along various canyons. At each junction loaded log cars were received by the A&SM from the Alamogordo Lumber

Company, and empties returned.

The final extension of the A&SM was Cox Canyon to Russia, a distance of 4.4 miles. The line, characterized by the same numerous trestles and sharp curves, was completed during May 1903. Russia was destined to remain the terminal of common carrier operations throughout the life of the railroad. Further extensions were built and operated by the lumber companies (Neal 1966:21).

Following the purchase of the NMRY&CCo properties by Phelps Dodge and Company on July 1, 1905, the A&SM was operated as an integral part of the EP&SW system. The use of specially equipped locomotives and log cars necessarily continued. The four cabooses and four open passenger excursion cars of the A&SM were supplemented by at least two EP&SW passenger coaches fitted with special short wheel-base trucks (Alamogordo News 1907a). El Paso and

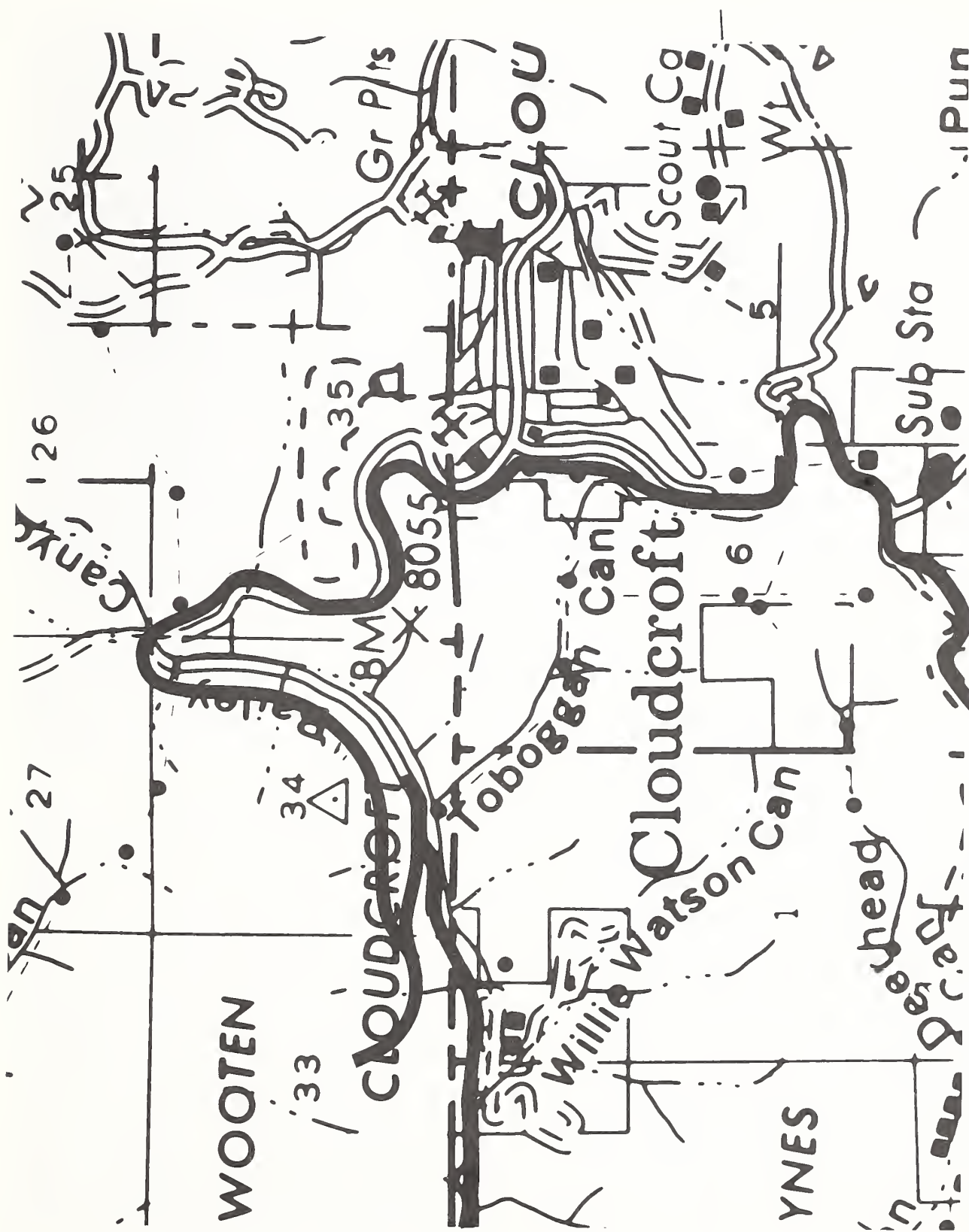


Figure 2. The steepest part of the A&SM was the last five miles to Cloudcroft, shown here by the heavy black line. Beginning at a point below Toboggan, grades ranged from 5 to 6 1/2 percent and the railroad clung to mountainsides all the way.



Figure 3. SP 2507 charging up the grade at Bailey's with a string of empty log cars, ca. 1936. E. Clack collection.



Figure 4. A train of empties passing over the "S" trestle, ca. 1936. The two locomotives are separated to avoid concentrating their weight.

Alamogordo families would move to Cloudcroft for the summer to escape the desert heat. And the weekend low-fare excursions from El Paso were sell-outs throughout the entire season. The Cloudcroft Lodge became the center of tourist activity (Figure 5).

The real business of the railroad to Russel was hauling logs. Although traffic fluctuated widely, as many as five trains daily ran on summer weekends: one passenger and four logging round trips. Even during the winter months, one or two log runs came down every day, with a similar number of cars being returned. One of the daily round trips carried passengers, express, and mail, usually in a single car at the end of the train. The peak years of log hauling occurred during the late 1920s when two companies were shipping over the railroad: George E. Breece Lumber Company from Cloudcroft and the Southwest Lumber Company from Russel. By this time the railroad had come under the control of the Southern Pacific. Although many changes had occurred in management and engineering, train service and rolling stock continued much as before. A notable improvement was the use of about 200 SP log cars, somewhat larger than the earlier Russel



Figure 5. The Cloudcroft Lodge was rebuilt as seen here in 1910-1911, following the burning of the earlier rustic wooden building in 1909. It remains in use as a resort hotel. July 1922. By J. D. Jones. USDA Forest Service photo 178085.

cars and equipped with dual air brake systems (Neal 1966:63).

Minor derailments were an everyday occurrence on the A&SM. They were considered a routine part of the relogging of that era. Runaways occurred all too frequently on the very steep grades, with sometimes fatal results. The worst wreck occurred on October 19, 1903, when seven men of a steel gang lost their lives in a wreck of heavily loaded cars of rail (Neal 1966:56). In August 1907 Engineer Weldy was killed when EP&SW locomotive 184 ran away on wet rail below Toboggan (Alamogordo News 1907c) [Figure 6]. But it is also a matter of record that no passengers were ever killed on the A&SM.

In addition to the logs and passengers, a lot of ordinary freight was handled on the S&SM. Produce, fruit, livestock and lumber went out. Incoming freight included coal for locomotive fuel, supplies, and machinery. From the peak traffic of the 1920s, business slowly deteriorated. The automobile traveling on vastly improved roads drained off the passengers, at the same time opening the mountain region to many more visitors from Texas and New Mexico. Special Cloudcroft excursion trains did not run after September 20, 1930, the closing date of the season. Rail passenger service was discontinued altogether after February 13, 1938 (Neal 1966:67).

Railroad logging south of Russie ended in 1941,



Figure 6. Engineer F. M. Weldy was killed when locomotive 184 ran away on the steep grade below Toboggan because of wet rail in late August 1907. Note the dirt ballast and absence of tie plates in the track, Orris Smith collection.

effectively eliminating all business there. Although the logging tracks were removed during 1942, the logging locomotives and miscellaneous rolling stock were not shipped out until 1945. After attempts to bring out the ancient locomotives by rail failed, they were cut up for scrap at Cloudcroft. Some log loading appears to have continued along the A&SM line after 1941, but rail shipments ceased completely with the sale of Southwest Lumber Company to M. L. Prestridge in 1945. As fewer and fewer trains ran down to Russia, it was only a matter of time until the Southern Pacific applied to the Interstate Commerce Commission for permission to abandon the branch. Permission to abandon the entire line from Alemogordo Junction to Russia was granted on May 7, 1947, but with a mandatory delay of several months

to hear any protests. The last scheduled train came down from the mountains on September 12, 1947 (Figure 7). And two days later the scrapers began pulling up the rails at Russia (Neel 1966:66, 67).

Rails, fastenings and spikes were sold as scrap steel. The rail was too twisted and worn for further use. Ties were picked up and sold locally, but most of the timber trestles remained where they had stood for so long. Some were dismantled and sold for their timber content. Up on the National Forest, the Forest Service removed the ties and stringers from the ends of the larger trestles as a safety measure to keep the unsuspecting and the adventurous from clambering out on the increasingly shaky structures (Neel 1966:68, 69).

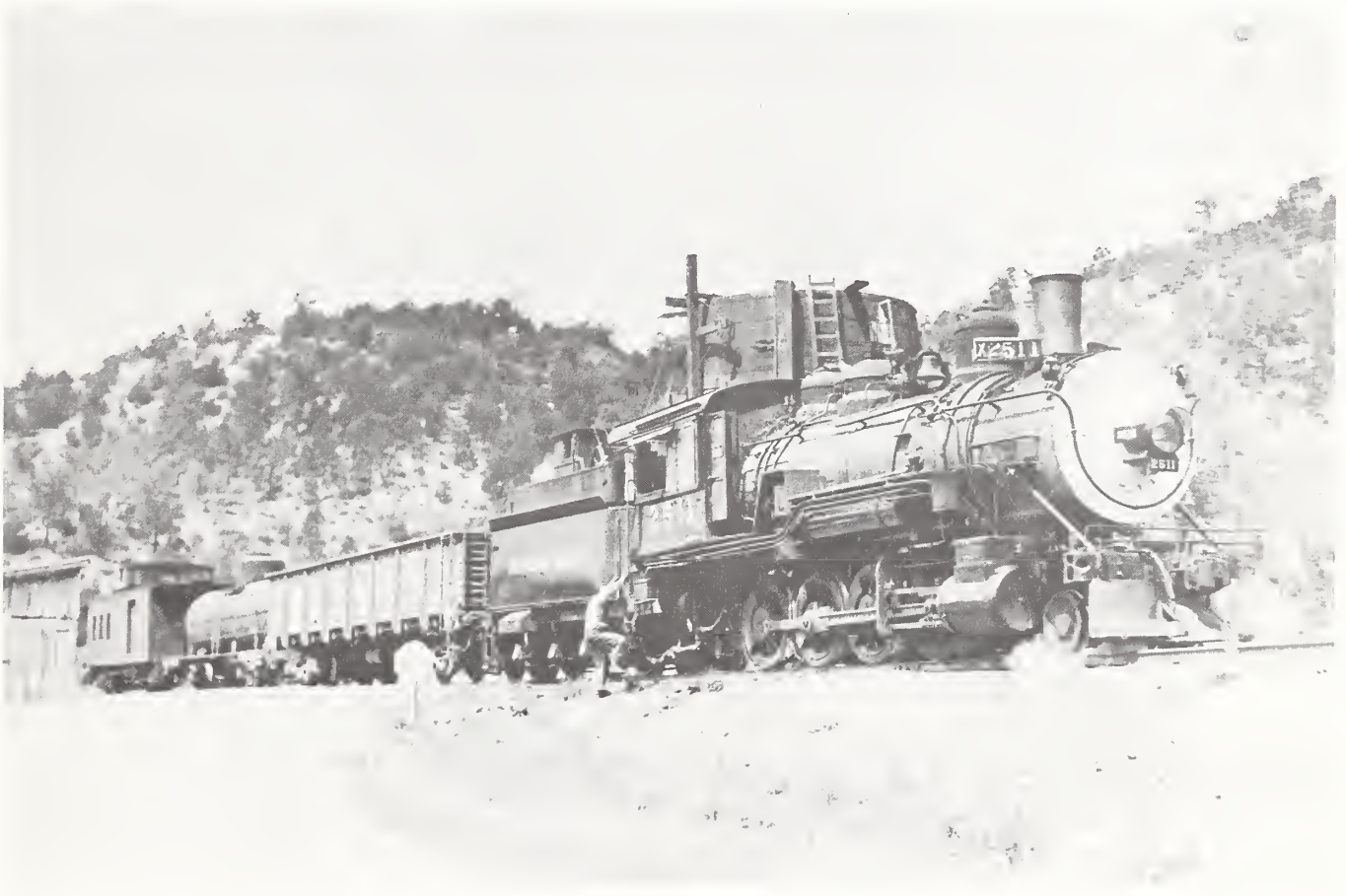


Figure 7. The last scheduled train stopped briefly at Wooten tank, September 12, 1947. This Baldwin 2-8-0 was one of several Southern Pacific Locomotives assigned to the Cloudcroft Line during the 1940s. By Den Kelly.

THE LOGGING COMPANIES

Alemogordo Lumber Company

The Alemogordo Lumber Company (ALCo) was organized by the same interests as the EP&NE and the A&SM railroads for the purpose of operating a lumbering industry in the Sacramento Mountains. Incorporation took place on May 19, 1898, in New Jersey. The major investors were the same as for the two railroads, and F. L. Peck of Scranton, Pennsylvania, was the first president of the company. The firm's capital was initially set at \$200,000, later increased to \$400,000 (Neal 1966:53; N. M. Corp. Comm. 1912).

Arrangements between the ALCo and the A&SM were defined in a lengthy agreement signed on December 6, 1898, by F. L. Peck and C. D. Simpson, respectively presidents of the two corporations. The terms of the agreement included the following provisions:

I. Lumber Company would build and equip a sawmill capable of sawing 50,000 board feet per day (11 hours).

II. Lumber Company was to supply energy, capital and labor to keep sawmill running.

III. Lumber Company would deliver all timber accessible to railroad lines which went to mill in Alemogordo.

IV. Lumber Company would build necessary laterals and tramways to deliver maximum amount of logs to railroad.

V. Lumber Company would provide suitable and sufficient number of cars (110).

VI. Railroad Company would have right to build line over Lumber Company land.

VII. Railroad Company would construct and provide a railroad from mill to summit of Sacramento Mountains and would extend it, if necessary, for supplies of timber. Would not build extensions over any route of over 5 percent maximum grade; or which required expensive bridges, fills, cuts, tunnels or other structures.

VIII. Lumber Company had right to acquire from Railroad Company necessary connections between its laterals and tramways and the railroad lines. All switches were to be under Railroad supervision and expense.

IX. Railroad agreed to receive all logs delivered to it and loaded safely, and to transport to mill at Alemogordo. Railroad would return empty cars to points designated by Lumber Company. Log cars had to have braking appliances as required by Railroad. Railroad was to pay no mileage or rental on cars.

X. Charges:

1. Logs - \$2.00 per 1000 board feet
2. Shingles, leths, etc. - fair rate according to selling price of merchandise
3. Materials and supplies used by Lumber Company in mountains and at mills - \$1.00 per ton in carload lots, 24,000 pounds minimum.

XI. Smaller lots for materials going rate - 50 percent rebate given.

XII. Statements to be sent 10th day of month.

XIII. Disputes to be arbitrated by chosen board (quoted in Neal 1966:53, 54).

Several significant elements are not specifically brought out in this agreement. One was that the ALCo owned a large amount of timber land in the mountains. During August 1901, the ALCo filed deeds for 26,080 acres of timberland, in 489 parcels purchased at \$3.00 per acre, or a net cost of \$78,242 (Alemogordo News 1901e). This land had been public land, held in trust by the Territory of New Mexico. As much as 30,000 additional acres were acquired using government land scrip. Another hidden element in the agreement was the expense and difficulty of constructing and operating the A&SM to the summit of the mountains, as it was quaintly termed. This clause resulted in the spectacular climb to Cloucroft, but it also resulted in a railroad that was forever terrifically costly to operate (New Mexican 1907).

During 1899 the ALCo build up its own plant. A mill site was selected in Alamogordo, on the west side of the railroad yards. On October 5, the new sawmill began operation. The mill was equipped with the usual collection of support shops and outbuildings, including a two-story 40 room boarding house [Alamogordo News 1899d, 1901f].

Out in the woods, the lumber company was loading logs at Toboggan, where a short spur may have extended into the timber. A steam loader was on hand later in 1899. Two Shay gear-driven logging locomotives arrived during 1899, followed by a third at the beginning of 1900. During June and July 1899, ALCo constructed its first logging spur out of Toboggan. It appears likely that this spur line up into Bailey's Canyon became the first two miles or so of the Cloudcroft extension of the A&SM a few months later [Alamogordo News 1899a, 1899b]. At the point where the A&SM line curved back across Bailey's Canyon, two ALCo spurs continued up the increasingly steep canyon. There was also a logging camp built in this vicinity. The shorter of the spurs ran a third of a mile or so to the north, while the other extended a mile or more to the northeast to upper La Luz Canyon. There is a possibility that this line ran further into La Luz Canyon. Around 1920, long after ALCo had departed, J. A. Work had a sawmill in Bailey's Canyon near the railroad [Alamogordo News 1899a].

As soon as the A&SM reached the head of Cox Canyon in June 1900, work began on the next set of logging spurs. One line took off eastward down Pumphouse [Hawkins] Canyon and another ran southeast down Cox Canyon [Neal 1966:55] [Figure 8].

The line down Pumphouse Canyon dropped downgrade to James Canyon. Here a logging camp was built, including a four-track engine-house and a crude elevated water tank [Figure 9]. Spur lines continued up and down James Canyon. The western spur extended about 1 1/2 miles. The eastern line ran 1 1/2 miles and split with spurs going into Orr Canyon and Young Canyon. The Cox Canyon line extended about 2 miles from the junction with the A&SM, and included a short spur up Pierce Canyon [Alamogordo News 1901e, 1901d].

In these early years, logging was done with hand saws and animal hauling using horses and mules.

Logs were skidded to landings along the railroad spurs, where they were loaded by steam loaders on the log cars [Figure 10]. Usually the logs would be accumulated until an entire trainload could be loaded [Figure 11]. Typically, the ALCo Shay locomotives worked on the logging spurs, and, when necessary, up and down the A&SM as well. The A&SM locomotives tended to stay on their own rails, because of their more rigid construction and their greater weight.

Later in 1900, work began on a box plant at the Alamogordo mill site. It was to be 44' x 88', two stories in height, and would employ 25 to 35 men [Alamogordo News 1900h].

The following year continued the pattern of activity and prosperity. Operations had settled into something of a routine. The railroad handled 850 cars of logs during May 1901. This represented two trains a day, including Sundays, throughout the month. In terms of running the railroad, it meant that locomotives, cars, and crews had to be found for two empty log trips and the passenger train, as well as for two loaded trips. All of the 110 log cars had to be kept in serviceable condition, for that number was none too many for the level of traffic.

In December 1901, ALCo ordered \$15,000 worth of equipment for a wood preserving plant. By June 1902 the plant was in operation, producing treated ties and timbers. Over the years to come, this was to prove one of the most useful and productive investments the company made [Alamogordo News 1901c, 1901g, 1902b].

By this time, the work of cutting trees and skidding them down to the rail spurs was being done by a contractor, the New Mexico Tie and Timber Company. Incorporated in Colorado on July 5, 1900, this enterprise included among its directors William Ashton Hawkins, who was Charles Eddy's very capable attorney. Another director was George Lewis, an experienced lumberman from the Chama and Canadian River districts of northern New Mexico [Alamogordo News 1900g]. This company used horses for logging, as well as a lot of manpower. Other services provided to ALCo included building railroad spurs and operating the log trains [Ibid. 1900d, 1901b, 1902a, 1905].

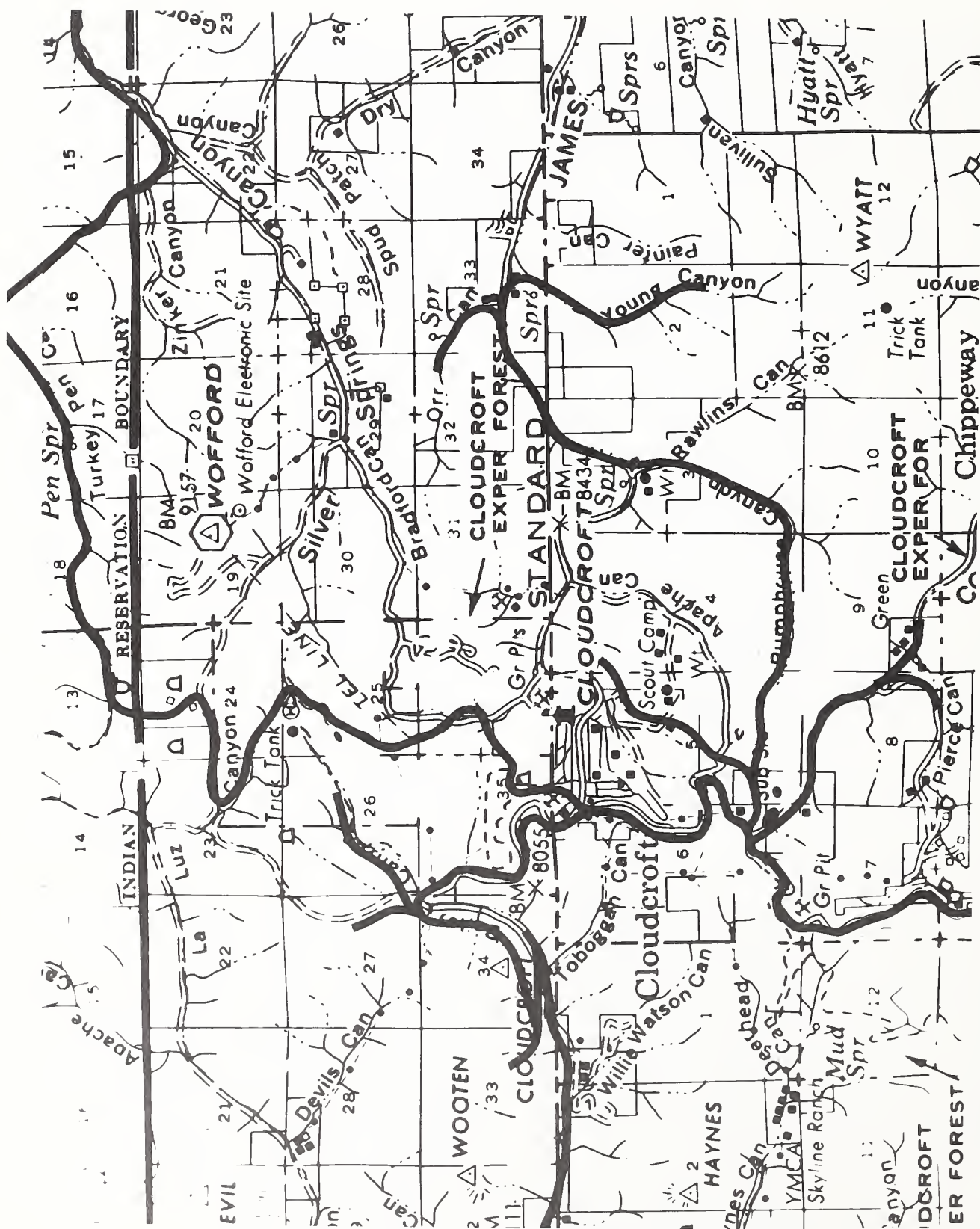


Figure 8. Railroads (shown by heavy black lines) in the vicinity of Cloudcroft.



Figure 9. Water tank and engine house at the Atemogordo Lumber Company camp in James Canyon, ca. 1900-1902. All four of the lumber company's Shay geared locomotives may be seen. By Green Edward Miller. Museum of New Mexico.

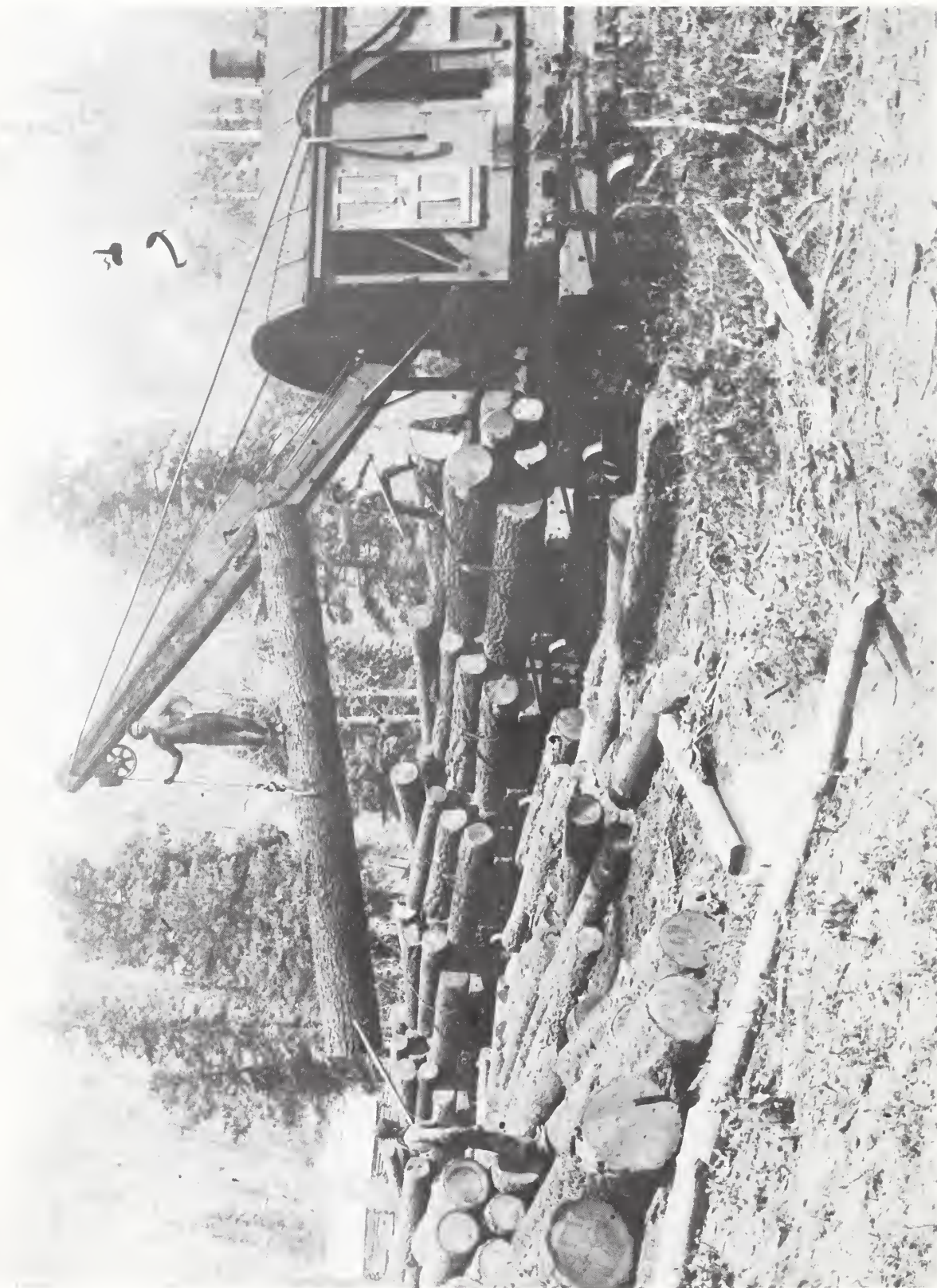


Figure 10. Alamogordo Lumber company steam log loader at work ca. 1899. By Green Edward Miller. Museum of New Mexico collection.

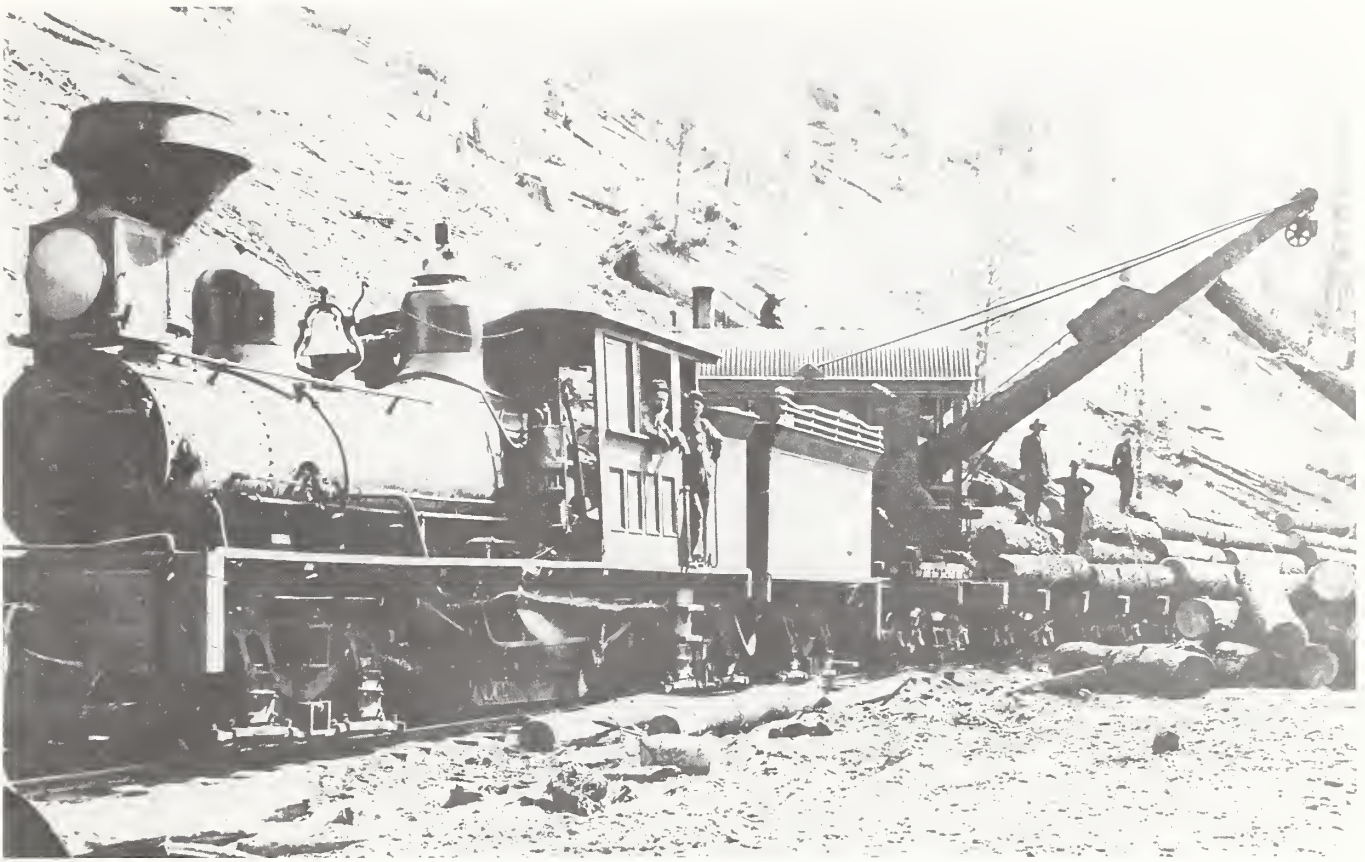


Figure 11. Alamogordo Lumber Company Shay geared locomotive and train loading logs. n.d. By Green Edward Miller. Museum of New Mexico collection.

In May 1903 the A&SM was completed to Russie at the head of Russia Canyon, where a logging spur connected with the A&SM. It switched back down the canyon and headed east. About a mile east of the junction the logging camp of Russie was built. It ultimately consisted of about a hundred wooden cabins and a few larger buildings (Figure 12). Included were the New Mexico Tie & Timber Company commissary, a railroad shop, a "roundhouse" for the four Shays, post office, school house and two cook shacks with mess rooms — one for the loggers and the other for the railroaders (New Mexican 1904).

By the end of 1903, the logging railroad and camp in Jamas Canyon had been dismantled, and about eight miles of track laid in Russia Canyon. The rails in Cox Canyon had been left in place, and in August 1906, a logging outfit was moved back into the canyon. A new camp was established in Cox Canyon near the "old Traversey mill site" (Alamogordo News 1903e, 1906b) (Figure 13).

The ALCo had its successes and its failures. It had a ready customer in its affiliated railroads, both during the construction period and later as ties and timbers needed replacement. Other customers appeared to be more difficult to please. The Arizona mines, especially those at Bisbee and Morenci, were obvious customers for pine timbers, yet that trade was slow to develop. There is an indication of some early problems with improper grading, but by 1903 the mines were buying timbers in million board foot lots. Late in 1903 the ALCo operations were enumerated at eight to eleven miles of logging railroad, four 65-ton Shay geared locomotives, a payroll of 650 men, and eight to ten million board feet of timber in stock (Alamogordo News 1903b).

The desired well ordered routine was punctuated at frequent intervals by the problems of relogging in new mountain country. The new roadbed softened with the summer rains, resulting in delays for land



Figure 12. Alamogordo Lumber Company logging camp, probably in Russie Canyon, April 21, 1907. By Green Edward Miller. Museum of New Mexico collection.

slides and derailments. Once in a while whole lengths of track would slide down the slope, stopping trains for a day or longer. Accidents involving trains or log loaders were frequent. Simple derailments were so common as to cause little comment, but runaways did enough damage to merit more detailed reporting.

On April 30, 1904, Shay locomotive number 4 blew up at Russie camp. The boiler flew through the air to land on the bunkhouse nearby. Fortunately the loggers as well as the train crew were at dinner in the dining hall next door, and no one was injured. The locomotive, however, was not so lucky and was junked [Alamogordo News 1904].

On a few occasions, such as in May 1905, railroad problems resulted in a shutdown of the Alamogordo mill due to a shortage of logs. This time it was a lack of locomotives that was the cause. Later in the year heavy rainfall was the cause of a similar shutdown. In the best of times it required constant effort to cut enough logs to keep the mill going [Alamogordo News 1903b, 1907b; New Mexican 1905a, 1905b].

But the problems of railroad logging were minor compared to the catastrophe that struck the ALCo in 1907. The situation began to take shape in May 1906 when one E. P. Holcombe, a special agent of the Department of the Interior, appeared at the Federal Building in Santa Fe to open an office. Holcombe was about to begin an investigation into alleged irregularities and fraud in the sale of timber and coal lands in the New Mexico Territory. In particular, he was interested in sales of public lands held in trust by the Territory of New Mexico which had been sold to the ALCo, the American Lumber Company, and the Pennsylvania Development Company [Alamogordo News 1906a]. The lengthy investigation resulted in the filing of a lawsuit by the United States government in early February 1907 against the Alamogordo Lumber Company alleging the fraudulent purchase of timberlands from the Territory of New Mexico. The basis of the charge was that the company had purchased the parcels of land in the names of individuals in its employ in violation of the requirements of the law.

One of the immediate results of the suit was the

issuing of an injunction prohibiting the ALCo from logging on the lands in question. Although the company had as much as 30,000 acres of timber with a clear title, they were evidently not prepared to log immediately. Logging continued along Russia Canyon until the end of 1907. During the fall, the company began building an eight mile railroad down Penasco Canyon. The route ran directly south from Russia station to the head of the canyon, then continued down the canyon. If completed, the railroad would have ended in the vicinity of Mercier. Only four miles of the Penasco line were completed before the company ran out of money. Construction ended near Johnson Canyon (Alemogordo News 1907f, 1908).

The Alemogordo mill shut down in late 1907 and all logging operations ceased (Alemogordo News 1907d, 1907e, 1911, 1913). During April 1909 the railroad tracks in Russia Canyon were removed, and the steel was salvaged. Immediately afterward, the tracks in Cox Canyon were taken up, leaving only the stub of the Penasco line (Alemogordo News 1909).

During the next few years it appears that only occasional logging took place along the ALCo railroads. Odd shipments of poles and ties were cut by small operators and shipped out by rail. During 1909 and 1910 much of the sawmill machinery was sold off, including the main steam engines which were nearly new (Alemogordo News 1908, 1910e, 1911). During 1910 the management of Phelps Dodge and Company, which had picked up the land and timber interests along with the railroad, announced their intentions to extend the logging railroad down the Penasco Canyon and to build a new sawmill in the woods, if and when the Federal suits were dismissed. The mill site was to be in Will's Canyon in the high timber country (Ibid. 1910b, 1910c, 1910e).

Around the end of 1911, rumors of the dismissal of the suits began to be heard, but little happened until 1913. Following statehood in 1912, the state courts assumed jurisdiction of the Federal suits and promptly dismissed them when they came up for action. By this time, of course, the business of the ALCo had become thoroughly disorganized and the property had deteriorated substantially. The company was no longer competitive, even for close customers in Arizona. By this time, most of the

southwest mines had become accustomed to using timber from the northwest shipped via reef and rail (Alemogordo News 1913).

On the other hand, the EP&SW railroad, under the same ownership as the lumber company, remained a good customer for treated timber products from the creosoting plant at Alemogordo. The ties and bridge timbers were cut by small private mills scattered through the mountains, and hauled by wagon or rail to the treating plant. The plant was kept particularly busy during 1912 supplying new ties for the Tucson extension of the EP&SW (Alemogordo News 1912e, 1912b).

There is no doubt that the ALCo was seriously damaged by the lawsuits. In spite of coming to nothing in the end, the suits had denied the company access to its most useful timber for an extended period, with the accompanying loss of markets. In order to bring the situation back to normal, a new company was formed and the business built anew.

Secremento Mountain Lumber Company

Incorporated in Arizona on August 7, 1916, the Secremento Mountain Lumber Company (SMLCo) took over the half-dismantled mill and part of the timber holdings of the Alemogordo Lumber Company. The latter firm continued to function, but only as a landowner and holder of timber rights on a mixture of National Forest and state lands. The logging railroads, locomotives and loaders went to the new company as well (N. M. Corp. Comm. 1916) (Figure 14).

By this time the market for ties and timbers was recovering. The SMLCo decided to replace the old horse and mule logging method with heavy machinery. They chose the Lidgerwood overhead logging system. Typically the Lidgerwood system utilized a multi-drum steam skidder with a steel boom and a system of overhead cables extending out from the skidder to a series of tail trees. A skidding carriage riding on the cables hauled the logs in to the skidder, which then used some additional cables and booms to load the log cars. The skidder itself was ponderous but moveable by rail when it had finished logging the surrounding area (Bryant 1923: 215-232). SMLCo owned one Lidgerwood skidder with



Figure 14. Sacramento Mountain Lumber Co. camp at Hudmen's, 1.8 miles north of Russia. May 1919. By Quincy Rendles. USDA Forest Service photo 162831.

a 74 foot steel tower, two without towers (presumably using spar trees at the skidder sites), and one Clyde skidder [The Timberman 1927]. In practice the skidders were located at points along ridge lines or high on the side slopes of large canyons. Logs were gathered in piles near the skidders for loading [Bryant 1923:215-232].

New SMLCo railroads were built starting in late 1916 from the end of the ALCo line in Penasco Canyon, near the upper end of Benson Ridge. One line followed the canyon slope high on the west side of Penasco Canyon. A longer line wended out of Benson Ridge, overlooking several heavily wooded valleys. This line served a logging camp and then split to follow ridges along both sides of Benson Canyon [Figures 15 and 16].

Rail operations remained much as before with the Shay locomotives gathering up short strings of log cars and hauling them up the steep climb to Russia. From the terminal, full trains were taken by the EP&SW down the mountain to Alamogordo [Weekly Cloudcroft 1917e, 1917b].

The SMLCo was never able to achieve a sustained operation. Troubles seemed to dog the company in every way possible. The year 1917 saw fires destroy timber and railroad equipment. The newest of the Shay locomotives was wrecked and out of service for several months. During the summer the company shut down completely. The published reason was "threatened labor troubles" but there was little sign of problems in the camps. The company spent a leisurely winter overhauling its equipment and resumed operations early in 1918. The following year was a better one and the company announced in August 1918 that it would add a box factory to its sawmill and planing mill in Alamogordo [New Mexican 1918].

The prosperity brought by regular operation in the wartime market was not to last. In January 1919 the sawmill was destroyed by fire. And, at nearly the same time, the boom markets ended. The entire operation was shut down at this time. The company's interest in further development of the property ended, and in July 1920 the business was sold to the Southwest Lumber Company [Neel 1966:61; Alamogordo News 1919].

Southwest Lumber Company

The next outfit to try its hand at lumbering in the Sacramentos was the Southwest Lumber Company [SWLCo], a New Mexico corporation organized by



Figure 15. Sacramento Mountain Lumber Co. railroad through Douglas fir cutting on Benson Ridge. July 1921. By S. Strickland. USDA Forest Service photo 163264.

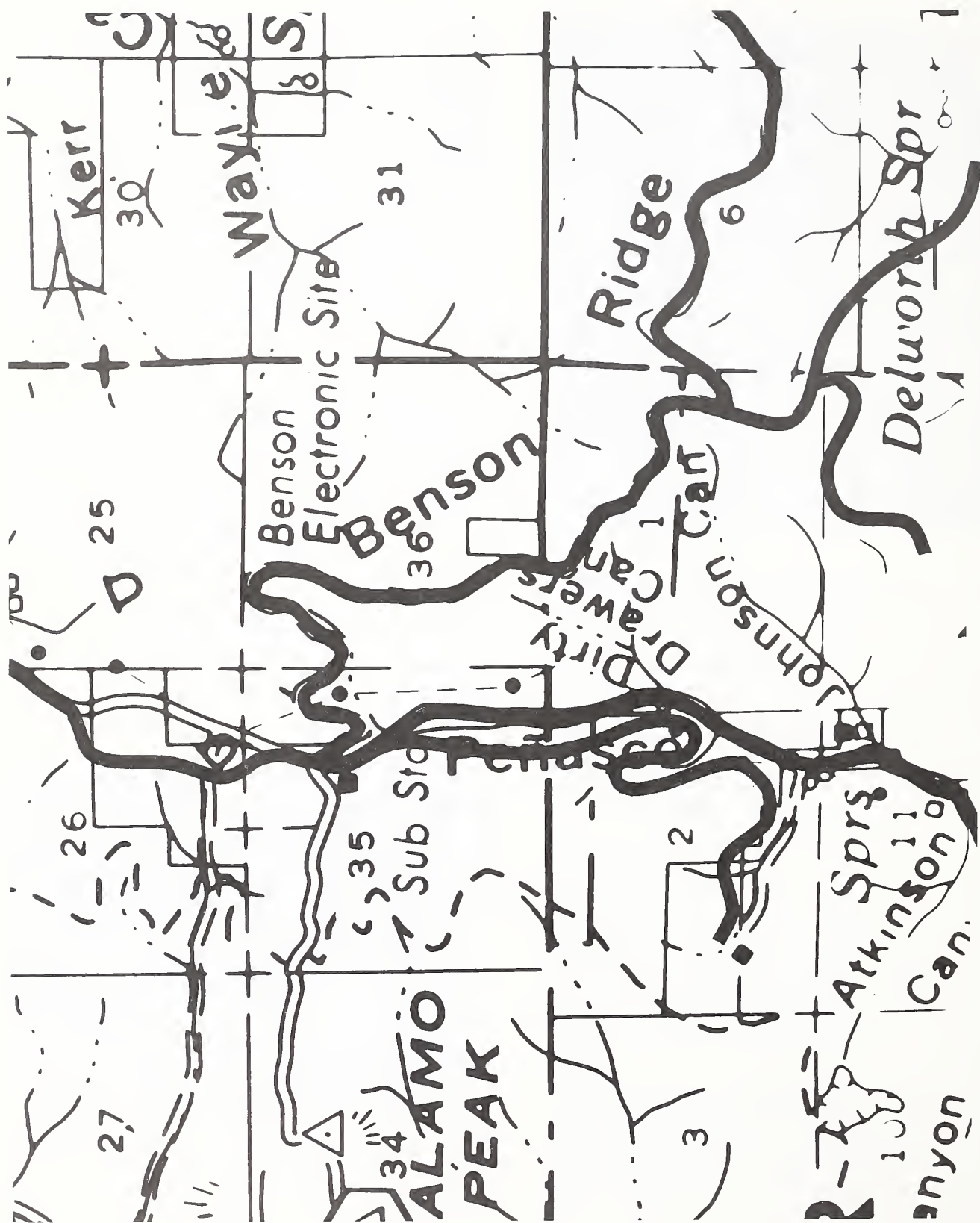


Figure 16. Sacramento Mountain Lumber Co. logging railroads south of Russia.

Louis Carr (Figure 17). Carr was an experienced lumberman from North Carolina, who brought with him the ample financial backing needed for such an enterprise. The SWLCo was initially capitalized at \$300,000. this figure was increased to \$400,000 during 1921, and finally to \$600,000 in mid-1922 (N. M. Corp. Comm. 1921, 1922). With Carr in the SWLCo were S. M. Wolfe, John T. Logen and C. W. Garmen.

In July 1920, SWLCo bought out the interests of the Sacramento Mountain Lumber Company. It took until the end of the year to get things moving once more. At that time it was reported that the debris of the burned sawmill had been cleared and new machinery was being installed. The capacity of the mill pond was to be doubled, which was one way to smooth out the erratic delivery of logs over the railroad. It was planned that logging and milling would begin sometime during February 1921.

The EP&SW was overhauling its log cars, and a crew of 15 or 20 men was repairing and extending the logging railroad trackage (Alamogordo News 1921b, 1922a, 1922b). Operations began as planned and the output of SWLCo increased steadily through the year. Beginning in February 1921 SWLCo commenced logging as planned using the heavy overhead logging equipment obtained from SMLCo. Logging progressed along Benson Canyon, with the rails being removed when logging was completed in late 1922. This was the last use of the skidders and overhead cables (Alamogordo News 1921e, 1922a). Subsequent logging would utilize the newly practical Caterpillar tractor in ever increasing numbers.

During 1921 SWLCo began a new railroad down Penasco Canyon from the end of track near Benson Ridge. The first two miles or so of this line were built over the deteriorating roadbed of the old ALCo line started in 1907 (Alamogordo News 1921d). To supplement the well worn Shays, a new Shay locomotive was purchased during 1921. October 1921 saw a production of one million board feet, with a ten percent increase predicted for November. This pace continued into 1922, and was apparently based on the general recovery of the Arizona copper industry following the post-war depression. The railroad was using three Shay locomotives in the woods and was moving an average of 15 or 16 loads daily and an equal number of empties (Ibid. 1922e, 1922c).

During 1922 SWLCo built its new permanent camp at a place called Mercia (Spoerl 1981). This became the terminal point for logging railroad operations with the woods engines bringing in loaded cars from the outlying areas to be consolidated into longer trains to be taken up to Russia.

During early September 1922, SWLCo purchased the remaining timberland of the Alamogordo Lumber Company. SWLCo had already been cutting timber on these lands under the supervision of an ALCo employee. Other timber purchases had been made by SWLCo on the National Forest and on state land. These lands were to the southward and eastward of the SMLCo lands (The Timberman 1927).

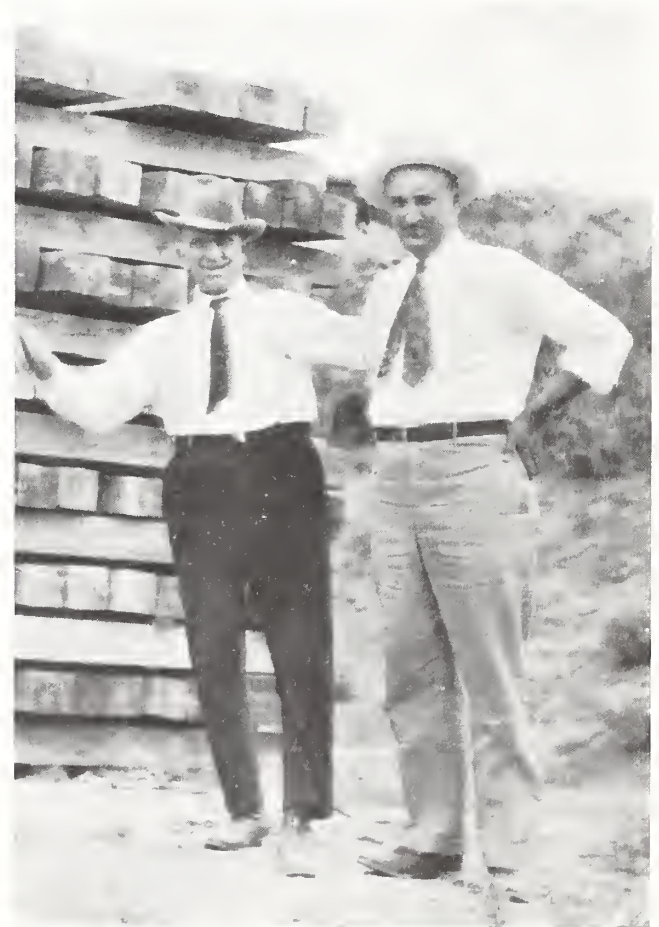


Figure 17. Louis Carr (r.), owner of Southwest Lumber Company and Lincoln N.F. Supervisor Arthur standing by stacks of untreated cross ties at Alamogordo. July 2, 1928. By E. S. Shipp. USDA Forest Service photo 233470.

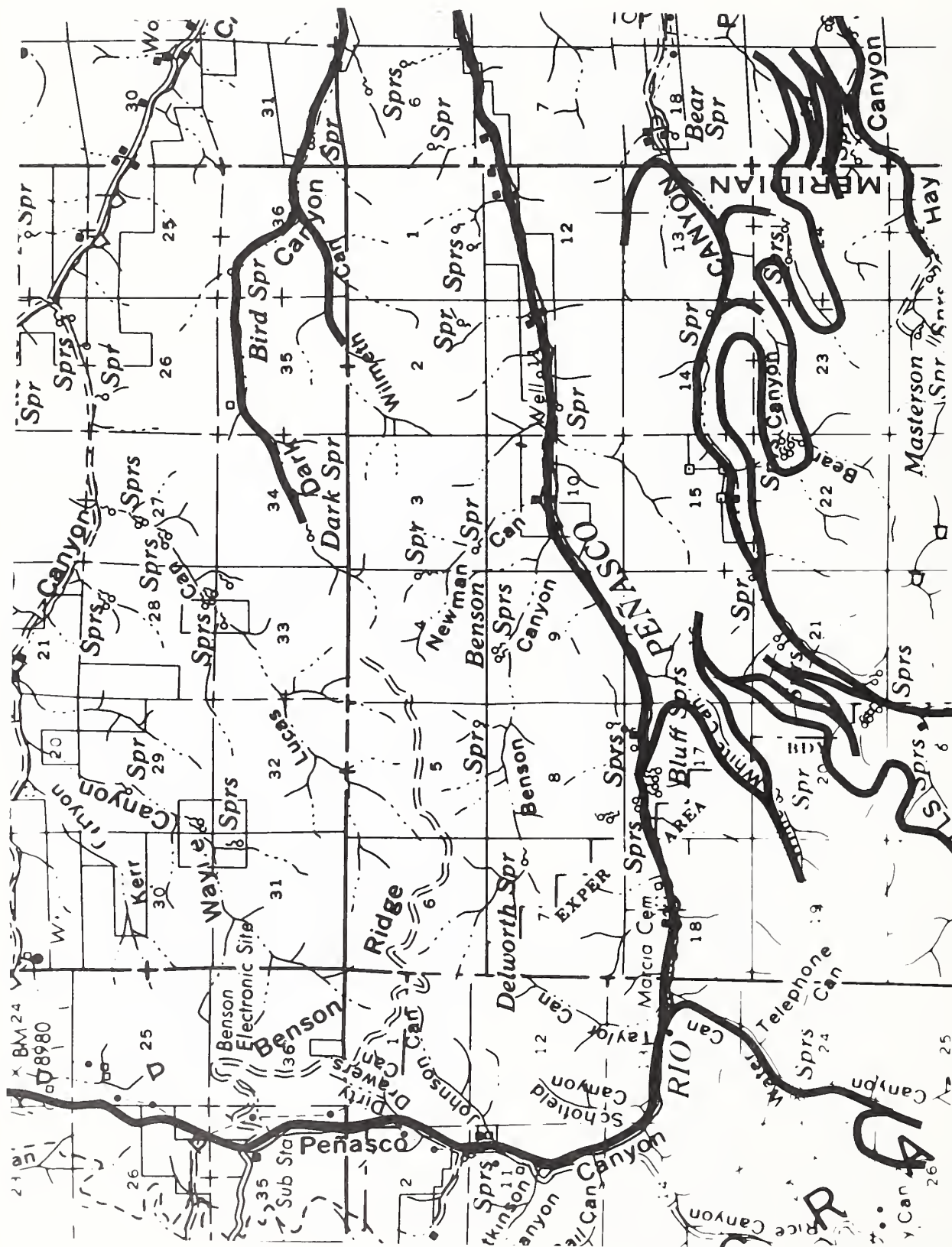


Figure 18. Southwest Lumber Company railroads around Penasco Canyon show sidehill construction and switchbacks for crossing ridges between canyons.



Figure 19. Logging crew with horses going into the woods from Water Canyon. The skidway disappearing up the side valley and the neatly stacked "cold decks" of logs are typical of the railroed reloaded points. June 28, 1928. By E. S. Shipp. USDA Forest Service photo 233051.

SWLCo extended its new logging railroad following Panasco Canyon down from Russia. The line passed by the camp of the Panasco Lumber Company at Longwell (see the Cloudcroft Lumber and Land Company section), and for a time ended near the permanent camp being established at Marcia. Water was plentiful here, and the canyon was wide enough for the numerous camp buildings and dwellings needed to support the logging crews. A locomotive shop, called the "roundhouse", and a machine shop were built and equipped to perform the necessary maintenance on the locomotives and steam loaders used in the woods (Spoerl 1981).

During 1923 and 1924 SWLCo continued to expand. The railroad was pushed to the south and east of

Marcia. The decision was made to climb up and over the intervening ridges rather than build twenty miles of track in the canyons to reach the timber in Wills and Hay Canyons (Figure 18). The new line climbed the south slope of Panasco Canyon and curved around the point into Willie White Canyon. Toward the head of this canyon, the track switched back and climbed to the ridge overlooking Wills Canyon. From this point the track followed the contours of the land and followed the slope southward for several miles. Logging in these distant canyons proceeded through the 1920s (Albuquerque Morning Journal 1923e; The Timbermen 1924e).

In the meantime, the company had been receiving logs from Ben Longwell's Cloudcroft Lumber and Land

Company, which was logging on the Mescalero Apache Indian Reservation. Logging along Penasco Canyon slowed somewhat but did not stop altogether. Then, as the Mescalero logging slowed to a halt due to a lack of capital, Longwell built his short rail spur up Water Canyon, west of Marcia [Alemogordo News 1925]. In late 1926, SWLCo began operating log trains over Longwell's track in Water Canyon, which had been built during the preceding year [Figure 19]. This line was extended beyond its initial three mile length between 1926 and 1928, with some switchback spurs heading up side canyons. The entire line was gone by 1930 [Alemogordo News 1925, 1931].

During the next few years logging continued without disruption. The logging locomotives were converted from coal to oil fuel starting in May 1928. This was both a fire prevention measure as well as an economy measure based on the rapidly dropping cost of oil [Alemogordo News 1928b]. In April 1929 logging engineer E. C. Owens was injured when his locomotive fell through a weakened trestle near Mercie. The upkeep of the railroad was getting expensive. Three section crews of six men each were occupied with track maintenance. They were also organized as fire crews in addition to their routine tasks [Alemogordo News 1928c, 1929e].

By 1927, SWLCo had disposed of the heavy steam skidders and had retained the services of Cooper and Otey, logging contractors who had worked on the Mescalero Reservation and for various logging companies out of Flagstaff, Arizona. Logging with horses continued in the steep canyons, but the newly matured caterpillar tractor found a place as well. The tractors were used with hydraulic steel arches, the successor to the oak "big wheels" used for years in the pine woods [Figure 20]. The use of tractors proved to be effective and very efficient, and their numbers grew accordingly [The Timbermen 1927] [Figure 21].

During May 1929 a fairly large quantity of state timber was advertised for sale. Located in Dark and Wills Canyons, the timber was just to the east of the current SWLCo logging shows. An estimated 15,344,000 board feet of pine and fir was involved. To everyone's apparent surprise, this sale brought to light a number of strong objections. Most of them came from the Roswell area from people

involved in the growing tourist trade. They feared for the degradation of the scenery along the increasingly busy roads into the mountains. SWLCo, the high bidder, bought the timber in August 1929, the sale having continued in spite of the objections [Alemogordo News 1929b, 1929c].

During this period of expansion, the logging railroads were extended in two directions. One line continued down Penasco Canyon into Cox Canyon and back up Dark Canyon. The other route was a spectacular series of switchbacks dropping down into Wills Canyon from the "high line" between Willie White and Hubbell Canyons [Figure 22].

Construction of most of the new SWLCo railroad south of Mercie involved much more earthmoving and preparation than the earlier routes. In 1921 a Marion Model 21 gas-electric power shovel had been purchased for just this kind of work. It saw plenty of use during the next several years building cuts and fills and side-hill roadbeds. In spite of the ability of a sharply curved logging railroad to follow the contours of the canyon slopes, a number of sizeable timber trestles were needed to carry the line across side canyons. As the rail lines grew in length, it became necessary to keep the running speeds up by eliminating switchbacks and rough spots in the track. This, in turn, required more expensive construction in the form of earthwork and trestles. The cost of log transportation was becoming an increasingly significant part of the overall cost of doing business [The Timberman 1924b].

At some time in the late 1920s, SWLCo decided to use switchbacks in a descending series to drop its tracks down into Wills Canyon. This arrangement accomplished the job with a couple of miles of steeply graded track hung on the canyon side. A sawmill with sidings was installed about a mile below the switchbacks. The line continued further down Wills Canyon for about four miles with short spurs going up several side canyons [The Timberman 1930; Resmussen n.d.].

A second rail line from the Wills Canyon sawmill climbed the south side of the canyon. Using a gradient exceeding four percent the line wound along the ridge, looped up Bear Canyon and finally ended up overlooking Hay Canyon. From this point



Figure 20. Caterpillar tractor and hydraulic arch hauling logs for George E. Breece Lumber Co. or Mescalero Apache Reservation. July 1928. By J. D. Jones. USDA Forest Service photo 230661.

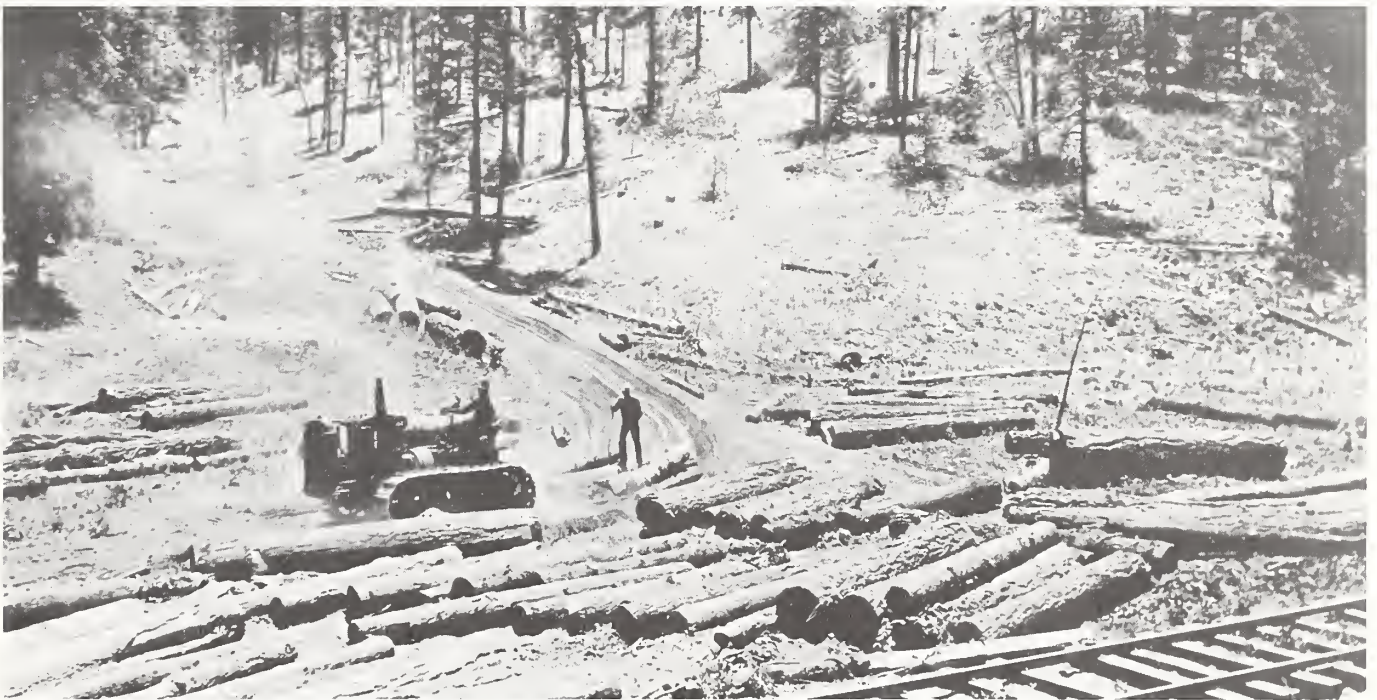
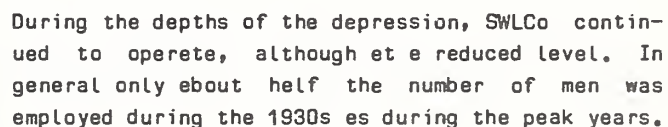


Figure 21. Skidding logs to railroad landing with Caterpillar tractor. June 1928. Probably by E. S. Shipp. USDA Forest Service photo 233022.



The Wills Canyon and Hay Canyon switchback railroads apparently operated into the 1930s (The Timberman 1924a). In July 1935 SWLCo was the successful bidder on an estimated 29,800,000 board feet of timber located in twelve sections called the Agua Chiquita unit. During 1936 the railroad was pushed up Wills Canyon and over the summit to reach the upper Agua Chiquita. From the high point at over 9420 feet elevation the line dropped down upper Scott Able Canyon, skirted the Sacramento Rim, and finally worked its way into Agua Chiquita Canyon. A camp with sidings was built close to Rogers Ruins overlooking the Sacramento River Canyon. The long rail extension brought the SWLCo total to 30 miles (Alemeqordo News 1936b).

At about the same time, SWLCo purchased the timber



Figure 25. Southwest Lumber Co. yards at Alamogordo, with railroad ties stacked awaiting creosoting at Southern Pacific Co. treating plant nearby. July 2, 1928. By E. S. Shipp. USDA Forest Service photo 233474.

on the Cloudcroft Reserve from the Southern Pacific Company. The SP was the successor to a series of corporations which had preserved the heavily forested environs of the village of Cloudcroft for decades. After considerable controversy, SWLCo built a logging railroad around the south and east sides of town and logged under highly restricted conditions [Alamogordo News 1935, 1936a, 1936b].

The routine of logging was interrupted suddenly when, on November 2, 1937, SWLCo Heisler locomotive number 3 exploded at Mercie. The boiler was blown about 200 feet from the frame of the locomotive. Tommy Wilcox, the hostler and night watchmen, was fatally injured. A nearly identical Heisler, number 15, was purchased from George E. Breece Lumber Company as a replacement [Alamogordo News 1937].

The timber resources available to SWLCo improved in 1940. Prestridge & Seligman, operating as the Velencie Company, began furnishing logs to the SWLCo mill. This was timber logged on the Mescalero

Reservation as a continuation of the earlier Breece contracts. The timber was hauled by truck all the way to Alamogordo, using six new trucks purchased that year [Alamogordo News 1940a, 1940b]. In addition, SWLCo purchased an estimated 30 million board feet of timber on the C. M. Hervey holdings between James and Cox Canyon. Special agreements protected the scenic and watershed qualities of the tract, and logging was done under Forest Service rules and supervision. Logging began in December 1940 [Alamogordo News 1940c].

Railroad operation continued into the war years. As trucks became more practical, they proved to be much cheaper than running trains over the tortuous logging railroad, now extended to thirty miles in length and requiring four locomotives. In late 1942, it all came to an end. The locomotives, cars and loaders were stored at Mercie, and all the wood spurs were taken up. The rail was sold for scrap and only the "main line" from Marcia to Russie remained [Neal 1966:65-66].

In spite of the wartime demands for lumber, it was clear that the SWLCo under Louis Carr was running down. The constant demands for higher wages, the long timber hauls and the aging sawmill all contributed to the decline. In 1943 Carr closed the main sawmill but continued to operate the planing mill finishing rough lumber shipped down from a small sawmill in the Agua Chiquita Canyon (Alamogordo News 1945).

It was not until 1945 that the railroad and logging equipment remaining at Marcie was brought up to Russie. One of the rusty Shay locomotives was fired up for the chore. During 1946, several SP trains carefully traversed the now little used track to Russie to bring out the SWLCo equipment for salvage.

P. S. Peterson, an SP engineer, and brakeman Wilbur Fifer had the job of bringing the remaining SWLCo locomotives down the railroad to Alamogordo. With locomotive 2510, they formed a train at Russie, with ancient logging locomotives separated by empty flatcars for added braking power. Peterson pulled the cumbersome affair down to Cloudcroft, and coasted right on by the water tank. The 2510 needed water, but lacked the power to back up the train to get back to the tank. And there was not time, under the Hours of Service Act, to cut off the locomotive and run down to Wooten for water and return. So he chained the whole outfit to the rails at the Cloudcroft depot and left with the 2510 for Alamogordo. In consideration of the risk in bringing the decrepit string down the steepest part of the mountain by rail, it was decided to leave the train where it stood. The entire outfit was cut up at the depot and trucked out (Neal 1966:66).

With the dismantling of the remaining logging locomotives at Cloudcroft in 1946, the era of railroad logging in the Sacramento Mountains came to an end. Although SWLCo was the largest such operation and was the longest lived, two other companies had operated logging railroad in the mountains as well. Their stories follow.

Cloudcroft Lumber and Land Company

In the Cloudcroft country in the 1920s, Ben Longwell was a man to be reckoned with. During a

few short years he put together three complete businesses involving all aspects of lumbering from contract logging through sawmilling. Having worked for a number of Sacramento Mountain logging outfits since 1899, Longwell knew the business thoroughly, and the country as well (Neal 1966:14).

One of Longwell's independent enterprises was the Penesco Lumber Company, incorporated in New Mexico on August 24, 1918. During 1919, a sawmill was set up about 5 miles south of Russie, which milled about 25 to 30 thousand board feet a day. The lumber was hauled by wagon to Russie, using a road improved by the Forest Service. A logging camp grew up around the sawmill site (Figure 26) (Weekly Cloudcroft 1918, 1919a, 1919b).

In 1921, Longwell and C. M. Pate, his partner from Louisville, Kentucky, organized the Cloudcroft Lumber & Land Company (CL&L) in New Mexico. Apparently the company had been incorporated several years earlier in Kentucky, and it was registered in New Mexico in 1921 as a foreign corporation (Alamogordo News 1921c).

The basis of the CL&L business was a contract between Longwell and the Bureau of Indian Affairs for the purchase of timber on the southern portion of the Mescalero Apache Indian Reservation. The area concerned was only a few miles northeast of Cloudcroft, amounting to some 30,000 acres of timberland in the Elk and Silver Creek drainages. About 160 million board feet of pine and fir was involved. The contract was advertised for sale during early 1920. Longwell, through CL&L, bid the minimum permitted and obtained the contract, which was finally approved on December 17, 1920, following some controversy over scenic values along the highways in the area (Kinney 1950:151-153).

It took a long time for Longwell and Pate to finance the development of their logging operations. During 1921 and 1922 Longwell was busy putting everything together. Among his activities was the surveying of a logging railroad north from Cloudcroft and east along Silver Creek to Silver Springs, a distance of about 8 miles. It was a well laid out line, with reasonable curves and a maximum grade of 3 1/2 percent (Alamogordo News 1923a). There was one major trestle of 346 foot length, with a maximum height of 36 feet. Grading



Figura 26. Lumberyard and sawmill of Penasco Lumber Co., four miles south of Russia. May 1919. By Quincy Randles. USDA Forest Service photo 162862.

of the railroad began in April 1923, but progress was slow. Longwall made arrangements to purchase a locomotive from the EP&SW, and rail began arriving for the new track (Alamogordo News 1923a, 1923b). Although 1 1/2 miles was laid during July 1923, the line was not completed to the cutting area until nearly a year later. Various problems delayed the work, but the greatest was a lack of strong financing. Wet weather, fire at a tie mill, and delays in bridge building were typical causes of the delays (Alamogordo News 1923c, 1924a, 1924b). In the meantime, lacking a large sawmill of his own, Longwall contracted to deliver his logs to the Southwest Lumber Company mill at Alamogordo. With this market for his timber, he rushed the railroad to completion during the spring of 1924, making the first shipment during the week of July 14, 1924. The Cloudcroft Lumber & Land Company was at last in business (Alamogordo News 1924).

The "new" locomotive of the CL&L was in fact one of the first four used on the A&SMRy. Rebuilt and equipped to burn oil fuel, it was well suited to its work (Howas 1965). The only other machinery of

importance on the operation was a new steam shovel and log loader. Purchased in 1923, it was used initially to build the railroad grade, and later to load logs on the rail cars. Cars of the EP&SW were used (Albuquerque Morning Journal 1923b).

The CL&L property included a camp and maintenance buildings in Cloudcroft, located just above the wya junction with the EP&SW (Figura 27). A woods camp was established in upper Turkey Pen Canyon, north of Cloudcroft just over the Mescalero Reservation boundary. At this point the railroad turned east to run down to Silver Springs Canyon.

By all accounts the timber on the Mescalero Reservation was of good marketable quality. But the cost of logging and shipping was high, with a 35 mile rail haul. In a little over a year after it began shipping logs, the CL&L was in receivership. On October 25, 1925, Longwall and Pate filed a petition of voluntary receivership in the District Court, and William Ashton Hawkins was appointed to be the receiver (Braece Papers 1935).

The assets of CL&L were of considerable value, especially the Mescalero timber contract. It was not long before some of the better financed timbermen were showing interest in it. By the spring of 1926, it became known that George E. Braece was negotiating with Longwall and Pate. At this time, Braece was logging in the Zuni Mountains to supply a big sawmill in Albuquerque. He operated three mills in Louisiana and Virginia, and he had a major interest in the new White Pine Lumber Company sawmill at Bernalillo, New Mexico (Alamogordo News 1926a, 1926c). Braece was successful in his dealings with Longwall and Pate and on June 3, 1926, the George E. Braece Lumber Company (GEBLbr) took over the assets and properties of the CL&L (Alamogordo News 1926c; Braece Papers 1935).

In the meantime, Longwell and Pate had become involved in another logging operation, which may have contributed to their financial strain. During June 1925 Longwell began laying railroad track along a three mile stretch of Water Canyon, connecting some timber he had bought about 1921 with the SWLCo logging railroad in Penasco Canyon (Alamogordo News 1921a, 1925). His development was slow and it was not until late 1926 that logging began. He made a deal with SWLCo to use their

George E. Breece Lumber Company



Figure 27. Log train passing the wye track in Cloudcroft leading to the George E. Breece Lumber Co. railroad. The wye tracks were built to connect with the Cloudcroft Lumber and Land Co. railroad. O. Resmussen collection.

locomotives and the EP&SW loggers to haul his logs down to the SWLCo mill. About one million board feet per month were produced by this operation, which continued for several years [Alemogordo News 1926f]. The railroad was extended further southward between 1926 and 1928, with a couple of spurs up side canyons. A camp was built at the confluence of Cethey and Brown Canyons [Figure 28]. When C. M. Pete died on May 2, 1928, management of the logging was taken over by his son-in-law, C. K. Cerron. Logging proceeded rapidly, and by 1930 the railroad and camp had been removed [Alemogordo News 1928a, 1931]. While this mill operation was going on, the former CL&L enterprise, now under the control of George E. Breece, was being transformed into a very substantial business.

Colonel George E. Breece brought with him to Alemogordo an expansive style of operation and enough capital to see the job through. In addition to purchasing the CL&L on June 3, 1926, he dealt with the Southern Pacific Company for rail and equipment to extend his logging railroad. And he was dealing with the Texas-Louisiana Power Company on a proposition to use the waste from his new sawmill to fuel a new steam power plant, which would supply Alemogordo and nearby towns with an expanded supply of electricity. And all of this was to be built as quickly as possible [Alemogordo News 1926a, 1926b, 1926d].

Within a month of the purchase of the CL&L, Breece had let contracts for a graded earth mill pond 300 x 600 feet, and for the structural work on a new steel and concrete sawmill. At the same time, the Texas-Louisiana Power Company began construction of its new steam plant. Both plants were located on a site purchased from George Carl, northwest of the SP depot. In that simpler era construction moved rapidly, and on February 23, 1927, the power plant supplied steam to the sawmill for the first time to test out the equipment [Figure 29]. And on February 27, 1927, the sawmill began cutting timber [Alemogordo News 1926e, 1927e, 1927b].

Up in the woods above Cloudcroft, Breece had been equally energetic. The railroad had been extended several miles eastward along Turkey Canyon to Cienega Canyon, and a camp had been set up in that vicinity. The old locomotive of the CL&L was refurbished and prepared for operation. The actual logging was contracted out. C. H. Cooper had two tractors at work and employed 150 men. He would soon add two more tractors [Figure 30]. J. C. Terkington logged with another crew of 150 men. Between them, the two contractors were delivering 75,000 to 80,000 board feet to the railroad daily. They began work about October 1926 [Alemogordo News 1926g] and had approximately four million board feet ready when the mill opened in February 1927.

As soon as the sawmill was completed and in operation, work began on the planing mill and box plant at the Breece mill site in Alemogordo. These new plants went into operation around June 1, 1927. The Breece enterprise was not without its prob-



Figure 28. Logging camp at confluence of Brown and Cethey Canyons operated by C. K. Carron in partnership with Ben Longwell. June 27, 1928. By E. S. Shipp. USDA Forest Service photo 233517.

lems. The sawmill was suddenly shut down in early 1927, soon after opening, when it was found the mill pond would not hold water. The solution came quickly if expensively in the form of a concrete lining. By July 11, 1927, the mill resumed operation (Alamogordo News 1927c, 1927d, 1927e).

Breece continued to operate at an intense pace (Figure 31). The railroad was extended to the east from time to time, following Silver Springs Canyon and then turning northward into Elk Canyon. It ultimately went about two miles up Elk Canyon. The national economic depression caught up with GEBL in 1930, and in early June the entire operation was shut down for an indefinite period. At this time, the operation employed from 350 to 400 men. The railroad included 25 miles of track,

both main line and spurs, with four locomotives and two loaders (Alamogordo News 1930a; The Timbermen) (Figure 32). There was a logging camp in Silver Springs Canyon with a machine shop, engine house, water and fuel tanks, and a large number of dwellings (Gilbert 1965) (Figure 33).

An interesting and damaging result of the Breece shutdown was the immediate stoppage of the waste wood fuel supply to the Texas-Louisiana Power Company. The utility was forced to use more expensive fuels and, finally, installed two diesel generator sets to supply Alamogordo and La Luz. The diesels were placed in use in late December 1932, at which time the steam plant was shut down permanently. To recover some of the unexpected expenses, Texas-Louisiana sued Breece for breach of



Figure 29. Georgia E. Breece Lumber Co. sawmill (right) and Texas-Louisiana Power Company steam power plant. The mill waste fed the steam boilers of the power plant, which in turn powered the sawmill as well as an electric light plant for the towns of Alamogordo and Le Luz. June 30, 1928. By E. S. Shipp. USDA Forest Service photo 233358.



Figure 30. Skidding logs with hydraulic crane and Caterpillar tractor on the Mescalero Apache Reservation. Georgia E. Breece Lumber Co. June 30, 1928. By E. S. Shipp. USDA Forest Service photo 233084.



Figure 31. Log landing end cut over slope on Mescalero Apache Reservation, George E. Breece Lumber Co. contract. February 26, 1932. By M. M. Cheney. USDA Forest Service photo 265477.



Figure 32. George E. Breece Lumber Co. loader working at landing on Mescalero Apache Reservation. The loader moves from car to car on rails permanently mounted on each car. June 30, 1928. By E. S. Shipp. USDA Forest Service photo 233085.



Figura 33. Cooper's logging camp in Silver Spring Canyon, Mescalero Apache Reservation, operated for Georgia E. Braeca Lumber Co. June 26, 1928. By E. S. Shipp. USDA Forest Service photo 233313.

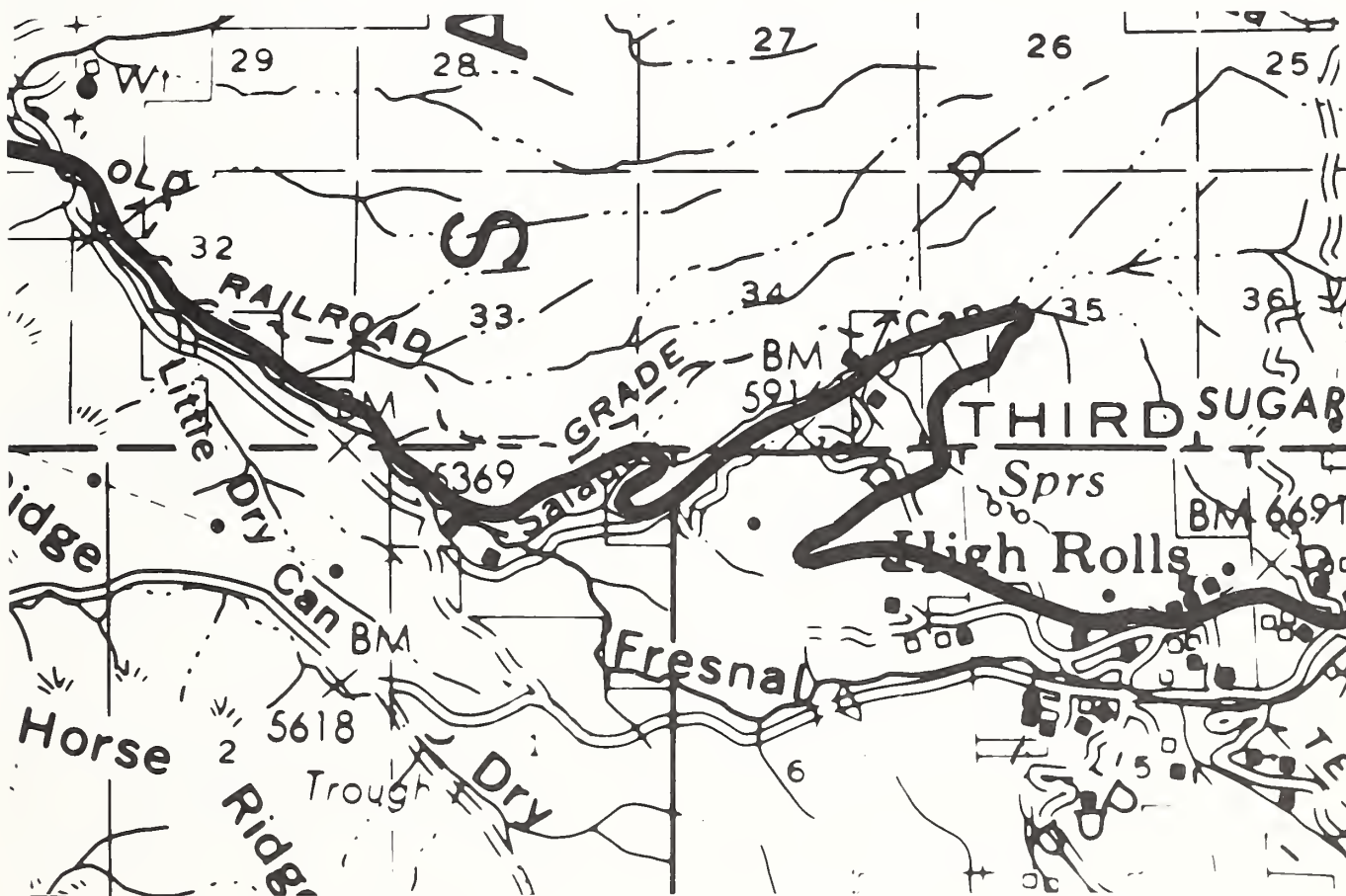


Figure 34. Alamogordo & Sacramento Mountain Railroad S-curves to gain elevation below High Rolls. The "old railroad grade" shown is in fact an old road.

contract, asking \$10,610.51 in damages for the failure to deliver fuel. Texas-Louisiana was itself in receivership at the time (Alamogordo News 1932b, 1932c).

Recovery was slow. Breece remained shut down until 1935, when a number of small circular sawmills were installed at various woods locations. Green rough cut lumber was shipped down to the planing mill at Alamogordo, but it appears that the logging railroad was little used, if at all, following the 1930 shutdown (Neal 1966:65). Breece sold the logging railroad for scrap to Walter B. Gilbert of Albuquerque in 1938 or 1939. Two of the locomotives were trucked out for use elsewhere, but Gilbert salvaged everything else on the railroad as well as most of the equipment and tools remaining at the logging camp (Gilbert 1965).

During the summer of 1940, Prestridge and Seligman bought the Mescalero timber contracts from Breece and began shipping logs to the SWLCo mill at Alamogordo by truck. This operation was conducted under the name of the Valencio Company (Alamogordo News 1940a, 1940b).

The Breece mill at Alamogordo remained idle until 1941. In March it was announced that Prestridge and Seligman had purchased the mill and would reopen it as quickly as possible. On June 3, 1941, the mill whistle blew for the first time in 11 years and 100 men went back to work. Another 100 were logging on the Mescalero Reservation. Twenty-five trucks were used to bring the logs down from the mountains, bypassing the railroad system in its entirety (Neal 1966:65; Alamogordo News 1941).

Epilogue

With Prestridge and Seligman established in the old Breece mill, and using trucks for log hauling, SWLCo was left with an aging sawmill, and a long expensive rail haul to feed it. Much of the rail system was older than the sawmill, and it was vulnerable to mountain weather and high maintenance costs. It came as no surprise when SWLCo shut down its logging railroad in 1942, ending the era of steam railroad logging in the mountains.

SWLCo continued a troubled existence during the war years. Strikes resulting from attempts to obtain better wages were a regular occurrence. Louis Carr protested in response that the money was just not available to pay better wages. Carr closed his ancient main sawmill in Alamogordo but continued to run the planing mill. It was fed with green lumber cut at the Frank Carr mill in Agua Chiquite Canyon.

In early September 1945, M. R. Prestridge, the head of Prestridge and Seligman, announced the purchase of all the assets of SWLCo, including a timber contract on the largest stand of private timber remaining in the Sacramento Mountains. It was stated that Prestridge and Seligman planned to build their own railroad into the timber from the connection with the SP at Cloudcroft (Alamogordo News 1945). This never came about and trucks were used for all subsequent log hauling to the Alamogordo mills. It was likely that this decision, which removed the primary economic justification for the continued operation of the SP Cloudcroft branch, that set the stage for the abandonment of the branch.

LOGGING RAILROAD TECHNOLOGY

The Nature of Logging Railroads

There ere many influences effecting the physical plant of logging railroads. Perhaps the most significant is the size and quantity of the trees to be cut and transported. Another influential factor is the engineering practice of the connecting main line railroad. Yet another factor seems to be the accepted practices of the area, which ere influenced by many things, including the background of the managers. All of these influences together result in typically distinctive logging railroads in a given timber region, and the logging railroads of the Lincoln National Forest were no exception.

In the early years the logging railroads were little more than extended sidings along the Alamogordo and Sacramento Mountain Railway main line to which logs were skidded for loading. The logging spurs tended to follow the more open valleys, both for ease of construction and for room to store logs prior to loading. As the logging moved further away from the A&SM line, the logging roads took on more of the character of the A&SM line itself. They matched its steep grades, its use of switchbacks and its very sharp curves. Curved timber trestles were notable for their numbers on the logging lines as well as on the A&SM line.

Civil Engineering

The A&SM line was built to a consistent set of engineering standards throughout its length. Its distinguishing feature was its many curves, practically all of them of 30 degrees or 193 foot radius. A seemingly endless series of such curves was utilized to wind the railroad around the mountain slopes while keeping to a constant gradient of something over five percent. Where the valley narrowed too much to permit even these sharp curves, as at Toboggan, a switchback was used to climb out of the canyon. In this way the consistent grade was kept as closely as possible. The short, very steep stretch just below Toboggan, said to be as much as 6 1/2 percent or 343 feet to the mile, proved to be the limiting or ruling grade for the entire line.

Railroad curvature is usually described in "degrees of curvature" meaning the interior angle subtended by a chord of 100 foot length along the curve.

This comes from the practice of surveying railroads along the line of the route by offsets. The very sharp 30 degree (193 foot radius) curves of the A&SM compare with the typical 20 degree curves of the Denver & Rio Grande narrow gauge lines (288 foot radius) and the one to ten degree curves of most standard gauge railroads.

On an aerial photograph or large scale map, the A&SM stands out because of the extreme geometric precision of its features. The consistent radii of the curves and the perfection of its straight or "tangent" portions are characteristic of the engineering of railroads (Figure 34). Combined with gradients of about five percent, rarely exceeding six percent, these features distinguish the railroad lines from trails, roads and all but the most modern of paved highways.

The logging railroads exhibit all of the same characteristics. The chief difference between the A&SM and the logging railroads was in their conception of permanence. The A&SM was designed and built to last as long as possible. Culverts and water crossings were designed and built carefully to handle the necessary drainage, including cloud-bursts and rapid snow melting. The entire roadbed was ditched for rapid drainage. The numerous timber trestles of the A&SM were built to standard designs allowing for ready replacement of individual timbers. The bridge decks were protected against fire with ballast or sheet metal. On the other hand, the typical logging railroad was intended to last only until the last tree rolled over the line. The subgrade could be less even and consistent. Provision for drainage, although necessary, could be less careful and certainly less permanent. Cross ties were usually untreated, with the intent they be used only once or, at most twice before they wore out. Customarily they were simply left behind when the rails were removed. Where the logging lines were longer lived, as with the line from Russia to Merced which functioned for twenty years, the differences became fewer.

In terms of appearance, the logging lines were laid with lighter rail, poorer ties, and the rails were less well aligned. Whereas the A&SM track at its best appeared geometrically perfect with smooth sweeping curves, the logging spurs were uneven, inconsistent, and included many kinks and minor

daviations. Curves were no sharper than those on the A&SM, for they were near the limits of most rolling stock in the first place [Figure 35].

In contrast to their often casual construction, the logging railroads were surveyed and carefully laid out to follow the contours of the land. Earthworks were minimized. Curves, especially when viewed in aerial photographs, appear precisely circular and the line of the straight tracks is quite precise in spite of the uneven track. A degree of care and consistency was required to ensure the stability of heavy loads and a minimum of derailments, but this was not always achieved.

The A&SM was built with rail of 60 pounds per yard, commonly referred to as "sixty pound rail." The rails of the logging spurs were varied, having been purchased in odd lots over a period of years. The weights per yard varied from 45 pounds to 65 pounds. This was generally considered light rail, especially after the first few years [The Timberman]. Table 1 lists rail dimensions.

Rail was a major item of expense in building the logging railroads. It was generally picked up and reused as long as it remained reasonably straight and undamaged. Even when badly worn or kinked it could be sold for scrap at prime rates. Thus, it is rare to find more than odd lengths of rail left behind by a logging outfit. Spikes and rail joint bars or fishplates are distinctive items of track hardware, and are found more frequently along an abandoned track. It should be mentioned that rail is marked with lettering and numerals along the web which reveals the rolling mill, year of production, weight and cross section of the rail itself.

Cross ties were usually used untreated on the logging railroads. They were of the same dimensions as main line ties, typically 7" x 9" x 8", especially if tie cutting was done nearby. Culls and poorer quality ties were found on the logging lines because their life was too short. Rails were often spiked directly to the ties without the benefit of tie plates to protect the timber. And it was not unusual to simply leave the ties in place when logging rails were picked up for use elsewhere. In fact, it is often possible to detect an old rail bed by the extremely thick growth of grass and trees fed by the rotting ties.

Table 1. Standard Rail Weights and Dimensions

Weight (pounds per yard)	Height (inches)	Base (inches)	Head Width (inches)
40	3 1/2	3 1/2	1 7/8
45	3 11/16	3 11/16	2
50	3 7/8	3 7/8	2 1/8
55	4 1/16	4 1/16	2 1/4
60	4 1/4	4 1/4	2 3/8
65	4 7/16	4 7/16	2 13/32
70	4 5/8	4 5/8	2 7/16
75	4 13/16	4 13/16	2 15/32
80	5	5	2 1/2
85	5 3/16	5 3/16	2 9/16

[after Howson 1921:127]

Balast supports the ties and distributes the weight of the trains along the roadbed. On main lines the balast is a water resistant material such as crushed rock, cinders, or smelter slag. On branches and short lines, it was often simply packed earth. This was the case in the Sacramento Mountain area railroads [The Railroad Gazette 1902]. "Dirt track" railroads, as they were called, were usually adequate in dry country, but they could be difficult to maintain and to use during wet seasons. In the early 1900s the A&SM and the Alamogordo Lumber Company had troubles with tracks sinking into the mud at the spring thaw. Only in later years was cinder balast, with some stone, used on the A&SM line, and then only in the bed spots.

Track switches, or turnouts as they are called on the railroads, have a very distinctive geometric form. The accompanying figure illustrates standard designs of the type typical of logging railroads

(Figure 36). The major parts of a turnout are the points and the frog. The points guide the wheels to one diverging track or the other, and there must be some mechanism to throw and lock them into place. The frog is the crossing of the diverging rails. Typically, turnouts are characterized by the frog number, which is a measure of the angle of divergence of the two tracks. That is, a number 9 frog diverges at an angle of approximately one in nine, and so forth. Other features of turnouts include the guard rails and their fittings, and one or two long heavy ties or "headblocks" which carry the point mechanism. Turnouts include many special parts of distinctive design as well as ordinary rail and fittings.

Because of the concentrated weights of rail equipment, water crossings on a railroad assumed highly characteristic forms. Culverts ranged from simple tie openings set just below the rails to very substantial box structures set deep in fills. Occasionally a chute over the tracks would be used to achieve drainage in deep cuts on sidehills. Timber trestles of framed or pile construction remain one of the distinguishing features of western railroads to this day. They were quick and cheap to build, although prodigal of timber (Figure 37).

Trestles would often be built to open a railroad as quickly as possible, to be filled in later to reduce maintenance costs and provide a more stable roadbed. Such an evolution was all but universal in the southwest, but it occurred only to a very limited extent on the A&SM. The use of numerous and large timber trestles continued throughout the life of the railroad, adding greatly to its cost of upkeep and concurrently restricting the speeds of the trains.

A trestle structure is very much standardized to permit rapid construction and easy replacement of individual timbers. Repair timbers could be stockpiled, and it was often possible to repair or replace a fire-damaged trestle in a matter of days. The basis of a trestle is a series of bents -- vertical frames -- precisely spaced at fourteen foot intervals. Each bent rests on a foundation or is made up of round piles driven into the ground. Each bent is capped with a cross timber. And the cap is then the foundation for either the deck carrying the track or another story of bents.

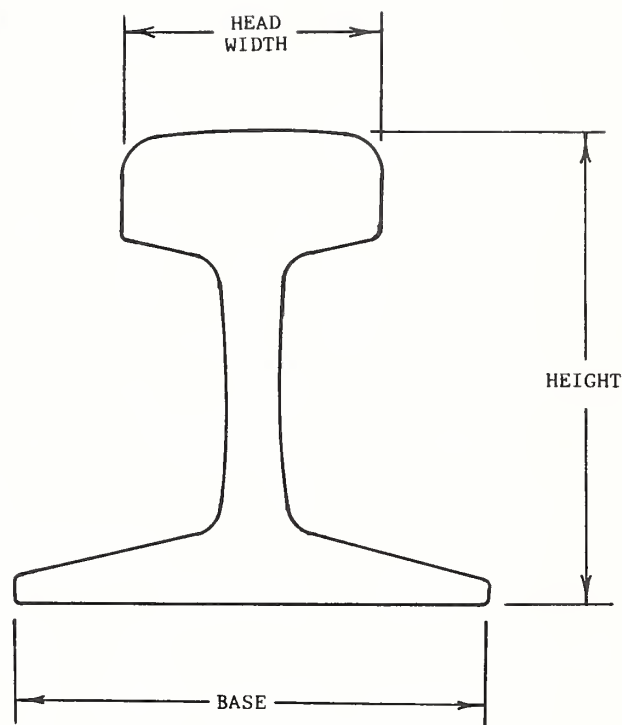


Figura 35. Typical rail section.

Longitudinal and diagonal braces complete the trestle.

Trestle designs are adapted to the weight of trains passing over them. Light duty trestles have four pile bents. Five or six piles are used for heavier loadings. Similarly, the decks may be made up of as few as four stringers for the lightest loads with as many as eight stringers for heavier loading. Ties are laid on the stringers to support the rails. Bridge ties are deeper and longer than ordinary ties and are laid closer together. Often bridge decks and ties would be protected with galvanized sheet iron and ballast for fire protection (Figure 38). Hardworking steam locomotives often dropped hot cinders or dollops of fuel oil along the track causing small fires.

Facilities

Locomotives and steam logging equipment required a lot of maintenance and adjustment to operate well. As long as the A&SM operated the owners kept a roundhouse and machine shop at Alamogordo to service the locomotives. Major overhauls and repairs

were done at the large El Paso shops built by the EP&SW in 1906.

Locomotive fuel for the A&SM was stockpiled at Alamogordo. During 1899 wood was used, but this was soon replaced with coal from Capitan and Dawson. During 1911 one locomotive was converted to oil fuel, followed by the others over a span of years. With either coal or oil fuel, one tender load would be enough for a round trip to Russia [Howes 1965].

Water was available on the A&SM for locomotives at Alamogordo, Wooten and Cloudcroft. Wooten had a plant for the chemical treatment of locomotive water in addition to its wooden water tank [Southern Pacific Co. 1935].

Fuel for the logging railroads was brought up to the main camps, such as Marcia, in car load lots. Coal was shoveled by hand into locomotive tenders or loader bunkers. Oil could be handled with pumps or elevated tanks. Water was provided only at the main camps, but the logging locomotives were all equipped with steam pumps or siphons to draw water from any available source in the woods. Water tanks were known to exist at the camps at James Canyon, Marcia, Hay Canyon and Ague Chiquita Canyon.

Muddy water from ponds and stream beds contributed much to the cost of running the logging locomotives. Boiler washing was required much more often. The mud would cause hot spots in the boiler, and would plug the gauge glass used to measure the height or level of water in the boiler. The latter condition could and did deceive

the engineman into believing he had more water in the boiler than he actually did. It is likely that conditions such as these caused the two disastrous explosions of logging locomotives in the Sacramento Mountains.

The main logging camps all had a "roundhouse," a crude engine shed where daily running repairs were made. A small but capable machine shop was an indispensable part of the facility. Most repairs to a logging locomotive or steam loader could be made in such a shop. Occasionally, however, logging locomotives would be sent down to Alamogordo and El Paso for major overhaul or boiler work. Car repairs were much simpler than locomotive work, and could be done in the logging camps or at Alamogordo as a matter of routine.

Shays, Heislars and Rod Lokeys

A modest but interesting collection of locomotives served in the Sacramento Mountains. More often than not they represented the typical and accepted practice of similar railroads across the country. The A&SM opened for business with two small locomotives, one a leftover from the Columbian Exposition where it had been exhibited by the Baldwin Locomotive Works. With only four drive wheels it quickly proved to be too small for regular service. It soon disappeared from the mountains. The second locomotive was an eight driver freight locomotive of a much more suitable design. The third and fourth locomotives were of the "consolidation" or 2-8-0 type, i.e., with a two-wheel lead truck and eight drivers [Figure 39]. These proved to be quite satisfactory and set the style for the A&SM for the rest of its life [Howes 1965].

From the beginning, the locomotives of the A&SM were specially equipped to cope with the steep grades and sharp curves. Drive wheels were low, ranging from 46 to 51 inches in diameter. On the eight-driver locomotives, flanges were omitted and tires widened on the four intermediate drivers. This theoretically reduced friction on the sharper curves, although in practice it also reduced tractive power. Later locomotives had all drivers flanged. The difference was made up with increased side play in the axle bearings. The A&SM locomotives all had longer than normal couplings between

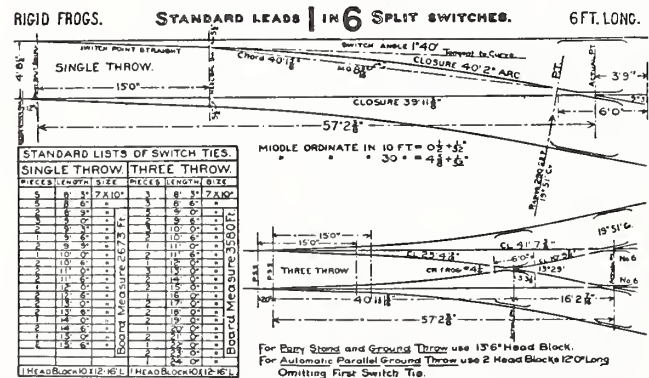


Figure 36. Typical turnout design.



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To Cloudcroft

Mexican Canyon

Figure 37. Detail of Mexican Canyon trestle, ca. 1936. Southern Pacific photo.



Figure 38. Log train on the "S" trestle below Cloudcroft, ca. 1910, showing the complex mechanical detail of steam reilroading. A layer of gravel is used to protect the ties end stringers from sperks. By Bailey Pharmacy.

engina and tender. A useful piece of gear invented on the A&SM was a steam-jat reil washer invented by engineer Jim Riddle. The jets cleaned the rail ahead of the drivers, assuring a greese free surface and maximum tractive power (Neal 1966:42).

The A&SM meda the headlines when in 1902 it took delivery of the largest Shay geared drive locomotive built to date. Obviously an attempt to increese the overall capacity of the reilroed, the locomotive was a magnificent machine weighing 291,000 pounds in working order (The Railroad Gazette 1902). The Shay locomotive was e patentad design built by the Lima Locomotive & Machine Company of Lima, Ohio. The boiler, cab, and tender were carried on four canter-bearing swival trucks.

A large three-cylinder double-action steam engine

was mounted on the right side of the firebox driving a longitudinal crenksheft. The boiler was offset to the left of the locomotive centerline to belenca the weight of the engina. Power was transmitted from the crenksheft to ell four trucks vie a longitudinal sheft system running low on the right side of the locomotive. Universels end slip joints accomodeted curves end uneven track. Bavel gears transmitted power from the shafting to the drive wheels. Strenga looking and lopsided to the uninitiated eye, Shay locomotives proved to be very effective on logging railroads in perticular and some 2770 were built between 1879 and 1945 (Koch 1971). Starting in 1899, the Alamogordo Lumber Company bagen using thrae 65-ton, thrae-truck Shays. Thay were quita successful on the logging spurs, and thara was planty of opportunity to try them out on the A&SM main line (Koch 1971:400-401).

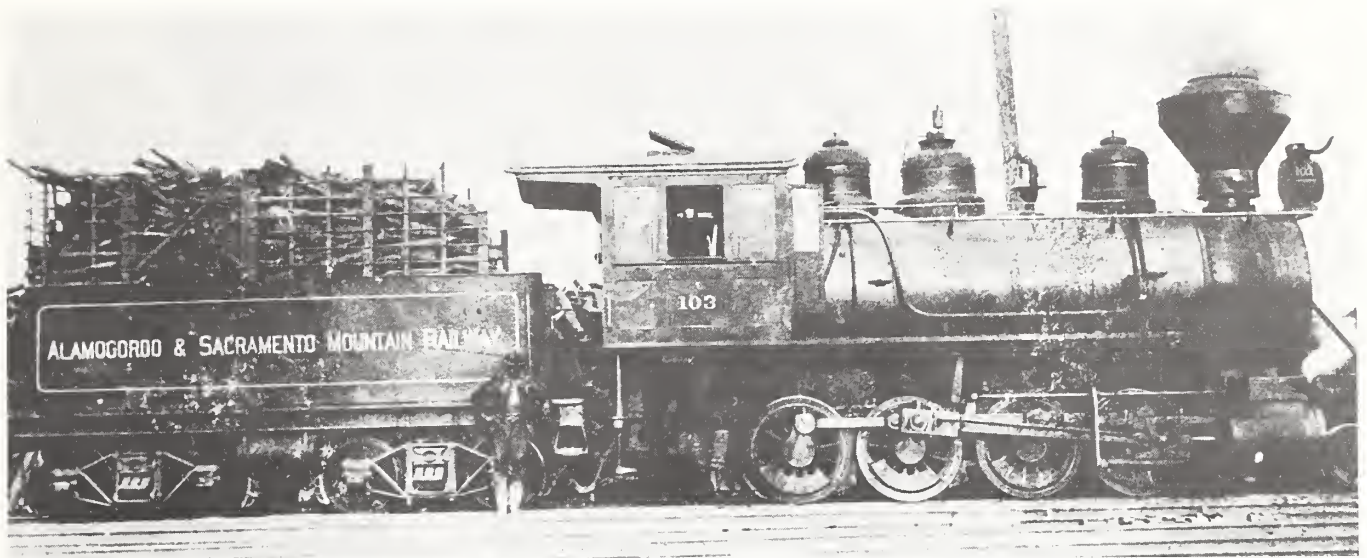


Figura 39. Alemogordo & Sacramento Mountain Railway locomotive in its original wood burning condition with high woodrecks and patented Radley-Hunter-spark-arresting smoke stack, ca. 1899. Soon afterward, coal fuel was used. This locomotive was further changed to burn oil fuel in 1914. William Bissinger collection.

Although it was not a long-term success, the big Shay made several spectacular trips over the A&SM. One trip saw it pulling 27 empty log cars of 16,000 pounds each plus a caboose weighing 12,000 pounds, a net weight of 222 tons, all the way to Cox Canyon. On another well recorded trip, the locomotive pulled 41 empty log cars and the caboose, net 334 tons, to Toboggan [Figure 40]. This train was too long to traverse the switchbacks [The Railroad Gazette 1902]. It is likely that trains of this length also proved to be unstable on the numerous sharp curves. The downfall of the Shay locomotive in main line service on the A&SM was its slow speed, coupled with high maintenance costs on the complex drive train. The difficulty of lubricating the gears and universals on a long run added to the problem. The big Shay did not find a permanent home on the A&SM and was sold in a few years [Howas 1965].

The original four A&SM locomotives were supplemented with members of a class of four EP&NE locomotives purchased in 1900. Two or three of this group were outfitted for service on the A&SM, and they continued to perform long after the big Shay was gone. These locomotives were conventional if small freight locomotives of the semi low-drawbar 2-8-0 type. Even at this early date, the locomotives

assigned to the A&SM were noticeably smaller than the locomotives going into service between El Paso and Tucumcari. The constraints of the sharp curves of the A&SM were already becoming apparent [Howas 1965].

Only two more locomotives were permanently assigned to the A&SM. These were a pair of 2-8-0 types obtained when the EP&SW purchased the Arizona & New Mexico Railway in 1921. Although larger than the other locomotives assigned to the A&SM, this pair was obsolete for other work in 1921. They found a home on the Cloudcroft line and remained in service until then and in 1947 [Howas 1965].

Various attempts were made to find more powerful locomotives for the A&SM. In 1916, the EP&SW purchased another four-truck Shay. This one was even heavier than the 1902 example, weighing in at over 150 tons. It was over a year being rebuilt at the El Paso shops, while roadbed improvements were made along the A&SM. It wasn't until January 1918 that trial runs were made, and they turned out to be dismal failures. The enormous locomotive proved to be too cumbersome for the sharp curves, and it demanded unreasonable quantities of fuel and water. On its last trip, it failed to reach Cloudcroft on a single tank of fuel [Weekly Cloudcrofter 1917c].



Figure 40. In early 1902, the brand new Shay patent geared locomotive, number 105, pulled a 334-ton train of 41 empty log cars from Alamogordo to Toboggan. The train was stopped for the photographer on the "S" curva between El Valla and Pinto. Baldwin-Lima-Hamilton Corp. collection.

This was totally unacceptable as a long-term proposition, and the big locomotive was sold in 1920 to the Red River Lumber Company in California. It worked there for many years (Howes 1965).

In 1922 the EP&SW tried once more to introduce a larger locomotive to the Cloudecroft run. In this attempt, a freight locomotive -- one of the older engines used for switching at Dawson -- was brought to Alamogordo, coupled to a heavy train and headed out for Cloudecroft. The locomotive broke a total of eight rails, seven on the sharp curves above El Valla, before derailling completely. The curves had won again (Alamogordo News 1918).

Over on the logging railroads, the Shay locomotive

proved to be the master of its work. The three logging locomotives bought during 1899 were all 65 ton three-truck Shays. The boiler, engine, cab and fuel bunker were supported by two trucks, with the water tank perched on the third truck. With a relatively light axle loading and short wheelbase trucks, the Shays were very much at home on the woods spurs, and were often found on the main line as well. Additional Shays were purchased in 1902 and 1921 (Figure 41). The last one was similar to the first, weighing 70 tons, and with many modernized details of construction (Koch 1971:455). An ancient used Shay was also purchased in the 1920s (Figure 42).

In 1927, needing more motive power, SWLCo purchased



Figure 41. Southwest Lumber Company log train near Russia hauled by Shay locomotive number 1. June 27, 1928. By E. S. Shipp. USDA Forest Service photo 233046.

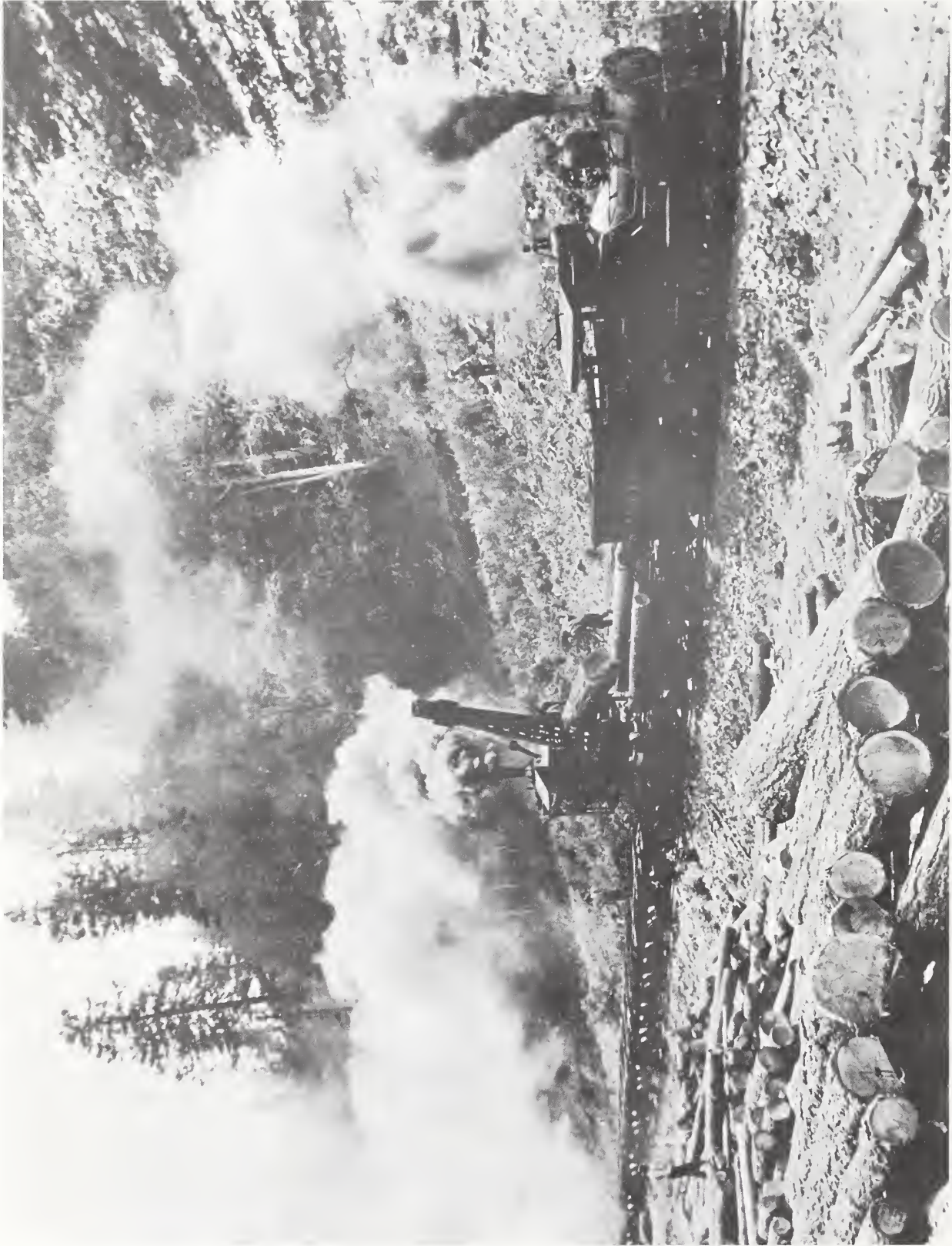


Figure 42. Southwest Lumber Company loading Logs in Water Canyon. Shay locomotive number 6. June 28, 1928. By E. S. Shipp. USDA Forest Service photo 233024.

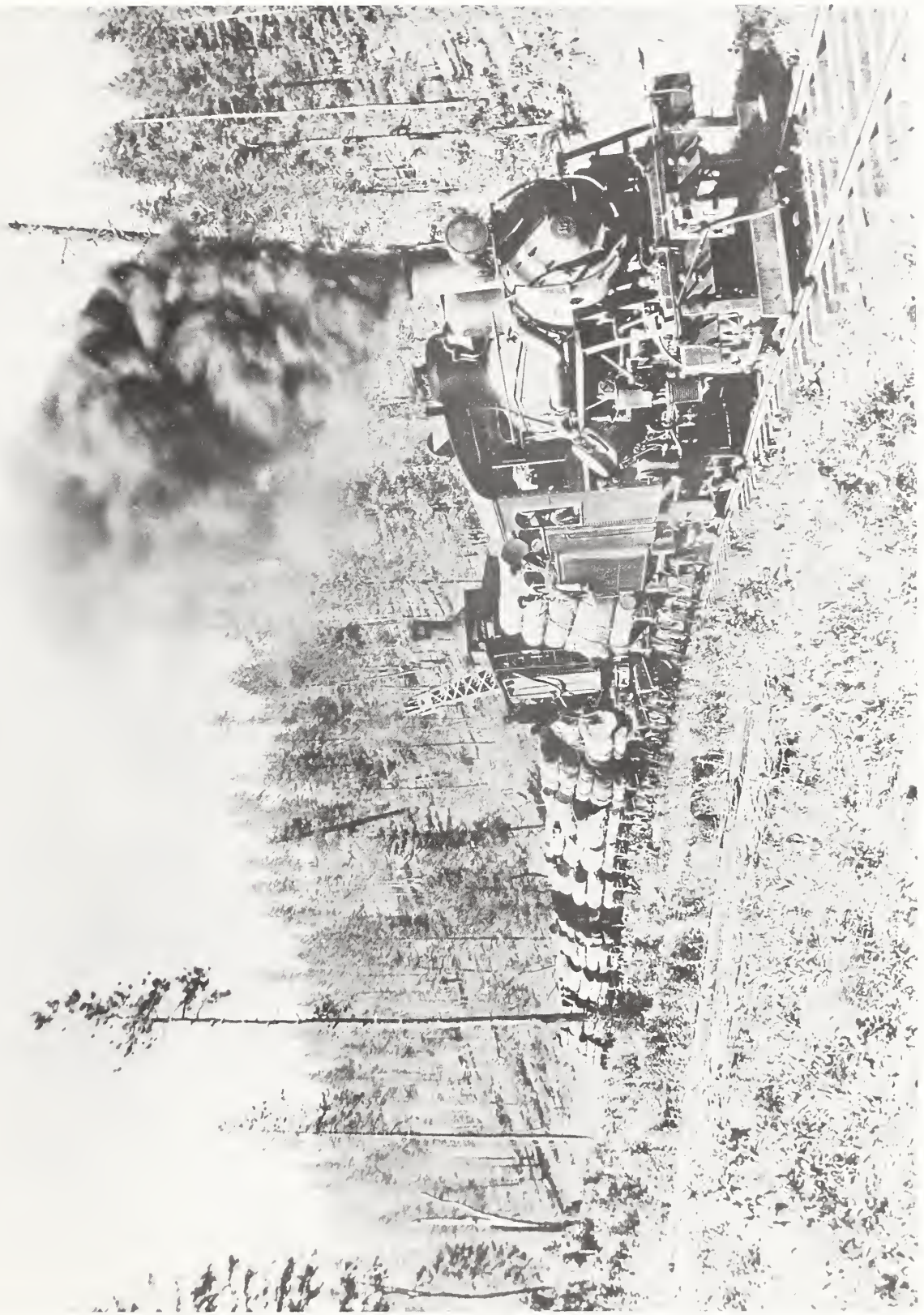


Figure 43. George E. Breece Lumber Co. log train, pulled by Heisler locomotive 15, leaving landing on Mesclero Apache Reservation. June 30, 1928. By E. S. Shipp. USDA Forest Service photo 233417.

e Heisler gear drive locomotive. The Heisler was at this time a serious competitor of the Shay. The builder had developed an efficient design that was growing in popularity in the west. The Heisler design placed a two-cylinder V-engine beneath the locomotive boiler midway between the two flexible trucks of the locomotive. The V-engine drove a central shaft, with universal joints to transmit power to the trucks. The third truck supported the water tank. The Heisler had the advantage of a symmetrical design, with some easing of the stresses on the track. Its disadvantage was that servicing required a pit between the rails [Anon. 1982] [also see Spoerl 1981:44, fig. 1].

The Breece railroad used five locomotives during its short operating lifetime. Each was of a different type, and only one was purchased new from the builders. Breece started out with one old locomotive originally built for the A&SM and sold to CL&L to open their operation. An additional locomotive was a 70 ton, three-truck Heisler purchased in 1926, only months before SWLCo bought theirs [Figure 43]. It was sold to SWLCo to replace their Heisler, which was destroyed in a boiler explosion [Anon. 1982:159, 161].

The backbone of the rolling stock fleet was the large group of log cars used to carry timber. During the early years, about 145 Russel skeleton frame cars were purchased by Alamogordo Lumber Company. Thirty five were delivered in December 1899, sixty in May 1900, and another fifty in late summer of 1900. A few such cars were apparently on the line when it opened in November 1898 [Alamogordo News 1899c, 1900b, 1900c]. The log cars were small and light, weighing about 16,000 pounds each [Figure 44]. They were about 22 feet long with 22 or 24 inch wheels, and were intended to carry 20 foot logs. The cars were equipped with Westinghouse automatic air brakes and hand brakes. By 1907, the ownership of the log cars had passed to the EP&SW and about 150 were in use [Official Railway Equipment Register 1907].

The A&SM owned four cabooses; three were short cars with side doors and cupolas. They could accommodate three or four passengers along with the train crew. The fourth caboose was something of a showpiece with a long well-vernished body and gold leaf lettering [Figure 45]. The car included accommo-

tion for the train crew in a cupola, a good number of seated passengers in one end, and baggage, express and the U.S. Mail at the other end. The passenger end of the car sported an elaborate brass railing.

The new resort at Cloudcroft resulted in a sudden explosion of passenger traffic which was carried in four open-sided excursion coaches hurriedly converted from flat cars. Longitudinal wooden benches and canvas curtains for the open sides were the only amenities offered [Official Railway Equipment Register]. It was not until the EP&SW had operated the railroad for some time that true passenger cars were operated on the A&SM line. At least two cars -- a combination baggage-coach and a full coach -- were equipped with short wheelbase trucks and wide-swing couplers to enable them to get around the sharp curves [Alamogordo News 1907a] [Figure 46].

Ordinary freight cars could easily traverse the A&SM line, provided they were not too long. As the years passed and freight cars grew in length, the SP found it necessary to place some restrictions on the cars permitted on the branch. The restrictions, published in the employees' timetables, prohibited cars over 42 feet length and over 14 ft. 6 in. height. Lateral play in the couplers was required to be over 2 inches either side of center [Southern Pacific Co. 1935].

About 200 larger log cars were brought in by the SP during the boom years of logging in the late 1920s. Similar to the Russel cars, these cars were larger and heavier, with regular 33 inch wheels. Car length was about 24 feet. An important feature of these cars was the retaining brake system. This added a controlled or direct straight air brake to the universal Westinghouse automatic air brake. A second brake line with hoses coupled between the cars was used to control the added brake. This added much to the reliability and safety of operations on the A&SM [Neal 1966:63].

Locomotive Rosters [Tables 2, 3, 4, 5]

The following locomotive rosters are in an abbreviated form, which may best be explained by the following example:

101 2-8-2T Baldwin #16103, 8/1898 46-21x24-135000

101 is the road number, i.e., the number assigned to the locomotive by the operating company, and usually found painted on the locomotive in one or more places.

2-B-2T represents the locomotive wheel arrangement in the Whyte System (Bruce 1952:19, 25). The first digit counts the pilot truck wheels. The second digit counts the driving wheels. The third digit counts the trailing wheels. Zero is used to indicate none. "T" means a tank locomotive carrying its fuel and water on the locomotive itself rather than in a separate tender. Gear drive locomotives are indicated by 3T Shay or 3T Heisler, indicating the number of driving trucks plus the maker of the locomotive.

Baldwin #16103, 8/1898 is the builder, builder's serial number, and date built (month/year). The builder's serial number is found on cast plates, usually attached to the locomotive smokebox, and is often stamped into other parts of the locomotive. The builders of concern here are the Baldwin Locomotive Works, Philadelphia, Pennsylvania; Lima Locomotive and Machine Company, Lima Ohio; Heisler Locomotive Works, Erie, Pennsylvania; H. K. Porter Company, Pittsburgh, Pennsylvania; and Schenectady Locomotive Works, Schenectady, New York.

46-21x24-135000 gives key locomotive dimensions:
46 is the driving wheel diameter in inches
21x24 is the diameter and stroke of cylinders in inches
135000 is the total engine weight in pounds.

Table 2. Locomotives of the Alamogordo & Sacramento Mountain Railway

Numbers		Descriptions	
101	2-B-2T	Baldwin #16103, 8/1898	46-21x24-135000
102	2-4-2T	Baldwin #13361, 3/1893	44-14x24-72130
103	2-B-0	Baldwin #16494, 3/1899	46-21x24-140600
104	2-B-0	Baldwin #17107, 11/1899	46-21x24-140600
105	4T Shay	Lima #673, 3/1902	40-(3)15x17-260300

Histories:

101. Built for New Mexico Coal & Ry. Co. as A&SM 101, to EP&NE 101, EP&SW 101, 201, 401, 420, rebuilt to 0-B-0 switcher, to SP Class SE-1 1300, scrapped July 24, 1934.

102. Built for Baldwin exhibit at 1893 World's Fair, to NMC&RyCo 6 in Dec. 1893, to A&SM 102, to EP&SW 202, 402, 2. To FC Nacazari 25 in 1906, to United Sugar Co., Los Mochis, Sinaloa in 1921, returned to FC Nacozari in 1926, scrapped Feb. 1, 1935.

103. Built as A&SM 103, to EP&NE 185, to Cloudcroft Lumber & Land Co. 1, April 24, 1924, to Breece 1, 1926.

104. Built as A&SM 104, to EP&SW 186, to SP 2504 Class C-14, scrapped Sept. 27, 1935.

105. Built as EP&NE 105, to EP&SW 100, to FC Mexicano 110 in 1905, out of service by 1923.



Figure 44. Loads of twenty foot logs on the Alamogordo & Sacramento Mountain Railway. ca. 1903-1905. By Royal A Prentice. Museum of New Mexico.

Table 3. El Paso & Northeastern Railroad El Paso & Southwestern Railroad Southern Pacific Company

EP&NE	EP&SW	SP	Descriptions		
52	181	2505	2-8-0	Baldwin #17397, 3/1900	50-21X26-141000
53	182	2506	2-8-0	Baldwin #17398, 3/1900	50-21x26-141000
54	183	2507	2-8-0	Baldwin #17443, 3/1900	50-21x26-141000
55	184	2508	2-8-0	Baldwin #17444, 3/1900	50-21x26-141000
-	99	-	4T Shay	Lime #1893, 8/1907	46-{3}17x18-213700
A&NM	EP&SW	SP	Descriptions		
19	217	2510	2-8-0	Baldwin #20237, 3/1902	51-21 1/2x28-176000
24	218	2511	2-8-0	Baldwin #26656, 10/1905	51-21 1/2x28-176000

Histories:

EP&NE 52-55. Two or three of this group were assigned to the Cloudcroft line at various times.

EP&SW 99. Built as Norfolk & Western 56, to EP&SW 99 in Dec. 1915, to Red River Lumber Co. in

1920, scrapped April 1929.

During the 1940s SP 2507, 2510 and 2511 were assigned to the Cloudcroft line. SP 2511 pulled the last train in 1947.



Figure 45. Dedication Day of the A&SM, celebrated at Toboggan on November 16, 1898. The elegant car combined the functions of passenger coach, baggage-mail-express car, and caboose in one vehicle, a necessity on the steeply graded railroad. By Bushong & Feldman. Museum of New Mexico photo 14914.



Figure 46. An excursion train ready to leave Cloudcroft, ca. 1909. Although the line had been owned by the EP&SW for several years, the open-sided cars remained lettered for the S&SW. Orris Smith collection.

Table 4. Logging Locomotives of the Alamogordo Lumber Company, 1898 - 1916:

Sacramento Mountain Lumber Company, 1916 - 1920: and Southwest Lumber Company, 1920 - 1945

Road	Numbers		Descriptions			
ALCo	SMLCo	SWLCo				
2	2	2	3T Shay	Lima #568,	3/1899	33-{3}14x14-128200# light
3	3	3	3T Shay	Lime #580,	9/1899	33-{3}14x14
4	-	-	3T Shay	Lima #587,	11/1899	33-{3}14x14
5	5	5	3T Shay	Lima #700,	6/1902	36-{3}14x14-137200# light
-	-	1	3T Shay	Lime #3155,	6/1921	36-{3}12x15
-	-	6	3T Shay	Lima #483,	3/1895	32-{3}12x12-86200# light
-	-	3	3T Heisler	Heisler #1540,	2/1927	70 ton
-	-	15	3T Heisler	Heisler #1534,	1926	70 ton

Histories:

No. 2. Built for F. L. Peck, Scranton, Pa., then Alamogordo Lumber Co.

No. 1. Built for Southwest Lumber Co., scrapped 1946.

No. 3. Built for Alamogordo Lumber Co., probably destroyed in boiler explosion ca. 1920.

No. 6. Built for C. M. Carrier, Pennsylvania, then to Southwest Lumber Co., scrapped 1946.

No. 4. Built for Alamogordo Lumber Co., destroyed in boiler explosion April 1905.

Second No. 3. Built for Southwest Lumber Co., destroyed in boiler explosion November 2, 1937.

No. 5. Built for Alamogordo Lumber Co., scrapped 1946.

No. 15. Purchased 1938 or 1939 from George E. Breece Lumber Co., scrapped 1946.

Table 5. Logging Locomotives of the Cloudcroft Lumber and Land Company, 1924 - 1926
and George E. Breaca Lumber Company, 1926 - 1940

Road				
Number		Descriptions		
1	2-8-0	Baldwin #16494,	2/1899	46-21x24-140600
3	2T Shay	Lime #2611,	1/1913	36-{3}10x10
6	2-6-2T	Portar #6727,	8/1922	44-19x24
15	3T Heisler	Heisler #1534,	1926	70 ton, 3 truck
102	2-6-2	Schenectady #5626,	8/1900	51-19x24-132000

Historias:

1. Built as Alamogordo & Secremento Mountain 103, to El Paso & Northeastern 103, El Paso & Southwestern 185. To Cloudcroft Lumber & Land Co. 1 on April 24, 1924, to Braaca in 1926.
3. Built as Grayling Lumber Co. 3, Arkansas City, Ark.; to O. S. Hewar Lumber Co., Monroe, Le.; to Breeca.
6. Built as McKinley Lend & Lumber Co. 6, Grants, NM. To Breece at Cloudcroft during 1920s. Trucked out ca. 1940.
15. Built for Breeca at Cloudcroft. Sold 1938 or 1939 to Southwest Lumber Co.
102. Built for Colorado Springs & Cripple Creek District RR. 102. To Breaca in 1920s.

CONCLUSION

The logging railroads of the Sacramento Mountains brought great changes to the Lincoln National Forest. During their time the area was transformed from a raw frontier to a highly organized forest district devoted to timber production, ranching and tourists. These occasionally conflicting interests influenced the application of railroad logging techniques and contributed to the conversion of the timber industry from rail to truck haulage after a relatively short forty years.

The age of the logging railroads generally coincided with the Golden Age of American steam rail-

roading. The early logging railroads reflected the latest and most ambitious technologies and practices of the time. For a variety of reasons, mostly economic, subsequent change and modernization never occurred, and the railroad loggers found themselves ever more obsolete and increasingly expensive. One by one they passed from the scene, leaving behind them fascinating ruins and traces of their time. This study has explored their history, physical plant, and technology to provide a basis for the more specific studies that will be made of areas within the Lincoln National Forest.

APPENDIX

These additional figures include more views of the railroads and other aspects of logging in the Sacramento Mountains. The costs of publication prevent us from being able to include every photo

found in the USDA Forest Service files. There are probably many more views in private hands and unknown to the author.

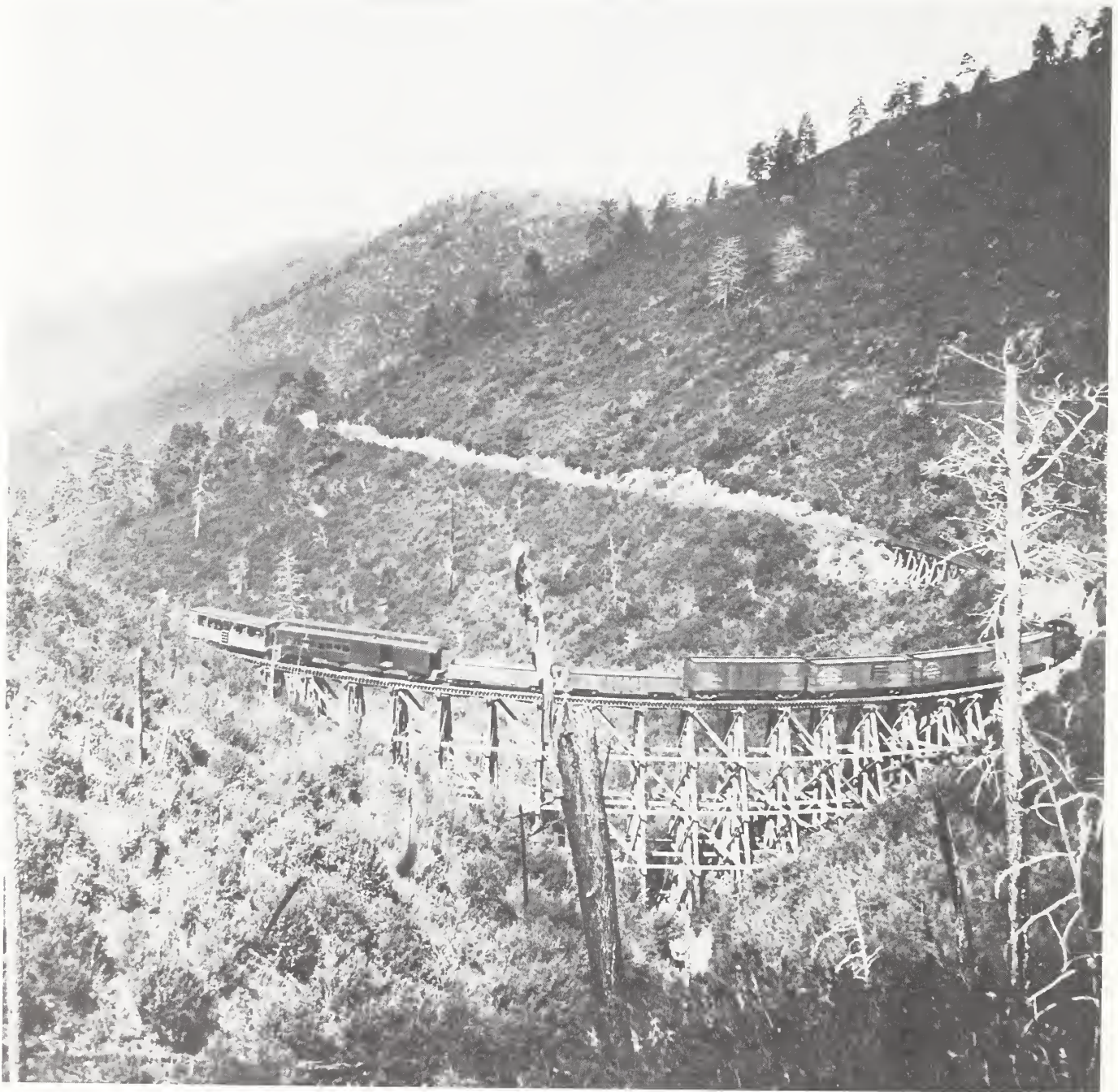


Figure 47. A down-bound EP&SW mixed train on the Mexican Canyon trestle below Cloudcroft. By Jim Alexander. Museum of New Mexico photo.



Figure 48. SP 2506 standing on the "S" trestle below Cloudcroft, ca. 1936. E. Clack collection.

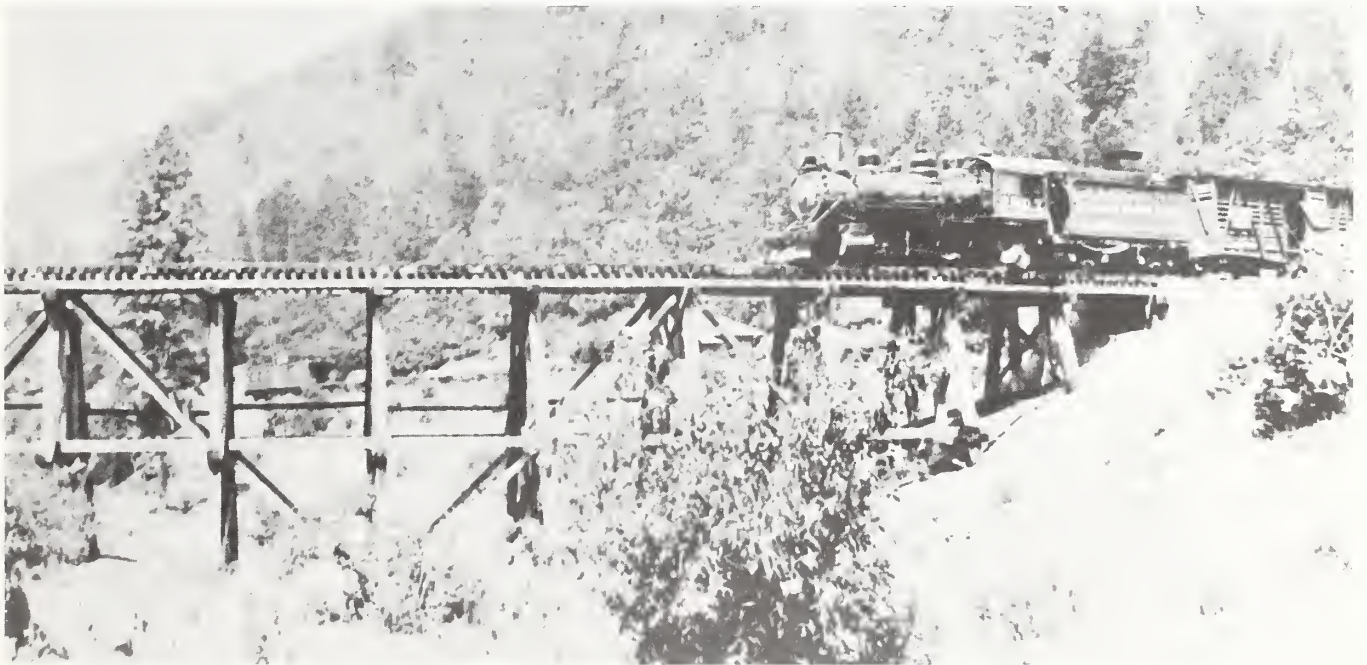


Figure 49. Locomotive SP 2507 pulling upgrade at Bailey's Canyon ca. 1936. E. Clack collection.

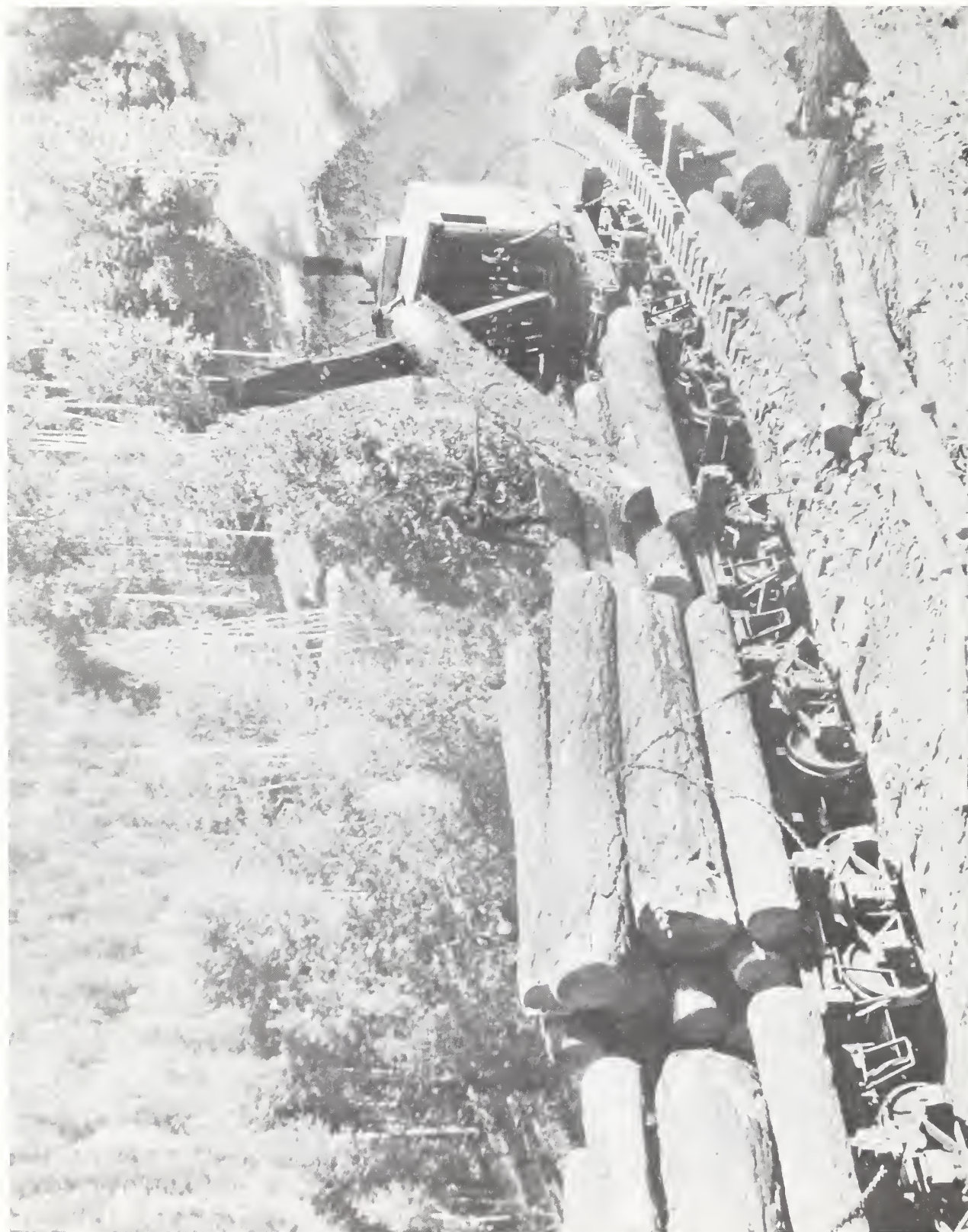


Figure 50. Picking up logs at chute terminal in Hubbell Canyon on Southwest Lumber Company railroad. June 26, 1928. By E. S. Shipp. USDA Forest Service photo 233029.

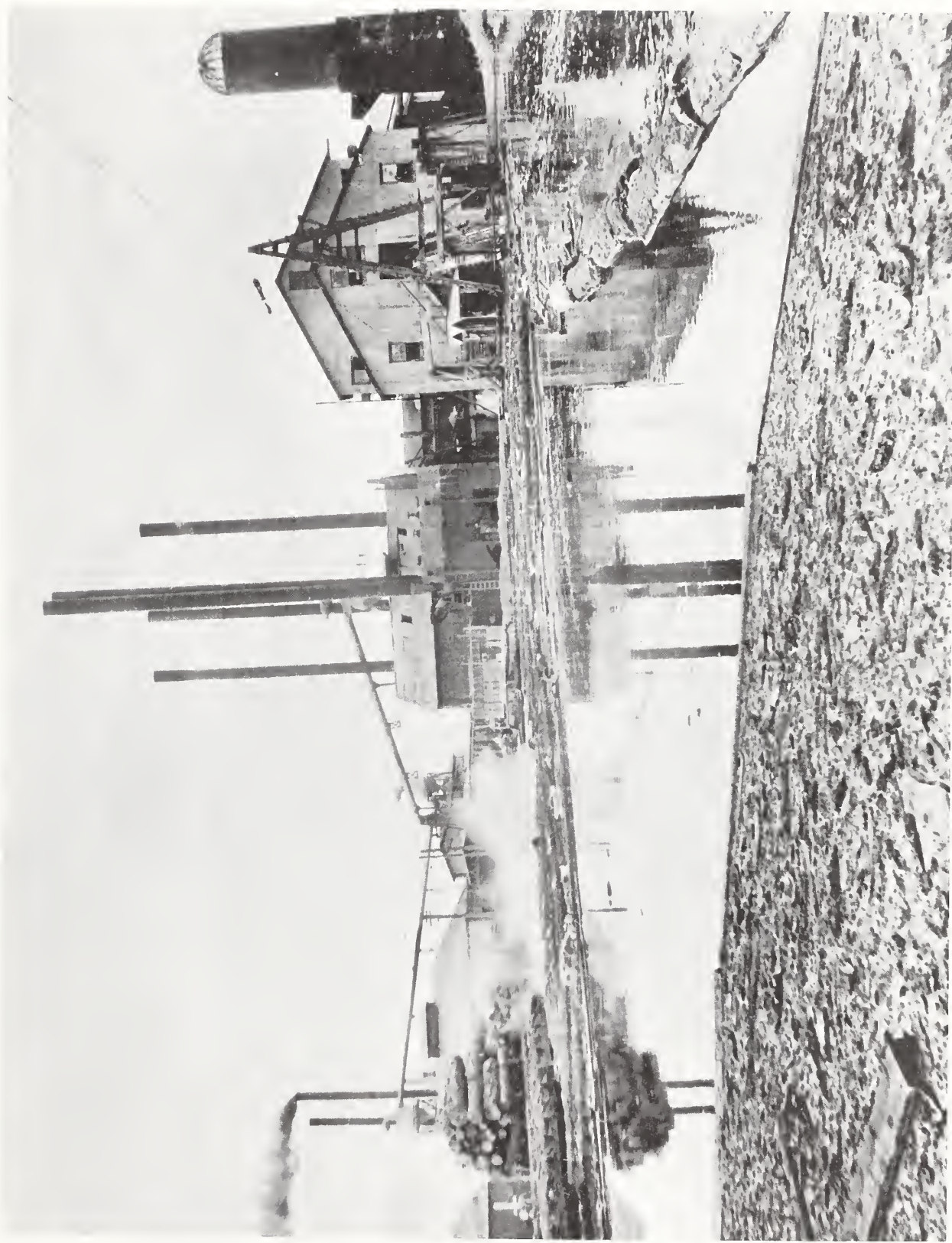


Figure 51. Unloading logs at Southwest Lumber Co. mill pond at Alemogordo. Power plant center; sawmill at right. July 2, 1928. By E.S. Shipp. USDA Forest Service photo 233472.



Figure 52. Log chute or skidway in action, with boy "greasing the skids." June 26, 1928. By E. S. Shipp. USDA Forest Service photo 233058.



Figure 53. Log skidway along Southwest Lumber Co. railroad in Hubbell Canyon. June 27, 1928. By E. S. Shipp. USDA Forest Service photo 233034.



Figure 54. Mule team skidding logs in winter on the Alemogordo Lumber Company. The log cers behind the team are loaded with ties and, on the left, a primitive water tank. n.d. By Green Edward Miller. Museum of New Mexico Collection.



Figure 55. One of the former Arizona & New Mexico Railway locomotives, as SP 2510, derailed as a result of a broken lead truck axle. S. A. Ramsdale collection.

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1900c	May 10	1923b	July 19
1900d	May 11	1923c	September 13
1900e	May 18	1924a	June 12
1900f	May 31	1924b	June 19
1900g	July 5	1924c	July 17
1900h	September 27	1925	June 25
1901e	May 11	1926a	April 2
1901b	May 18	1926b	May 27
1901c	June 1	1926c	June 3
1901d	August 3	1926d	June 24
1901e	August 10	1926e	July 15
1901f	August 24	1926f	October 21
1901g	October 19	1926g	October 28
1902e	March 1	1927e	February 24
1902b	March 18	1927b	March 3
1903a	April 18	1927c	June 23
1903b	August 1	1927d	June 30
1904	May 6	1927e	July 14
1905	September 23	1928e	May 3
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1906b	August 25	1928c	July 12
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1911	December 21	1936a	May 28
1912a	April 4	1936b	July 2
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Figures 9-12, 44, 45, 47, and 54 - Museum of New Mexico.

Figures 3, 4, 48, and 54 - E. Cleck Collection.

Figures 6 and 46 - Orris Smith Collection.

Figure 27 - O. Rasmussen Collection.

Figure 37 - Southern Pacific Railway.

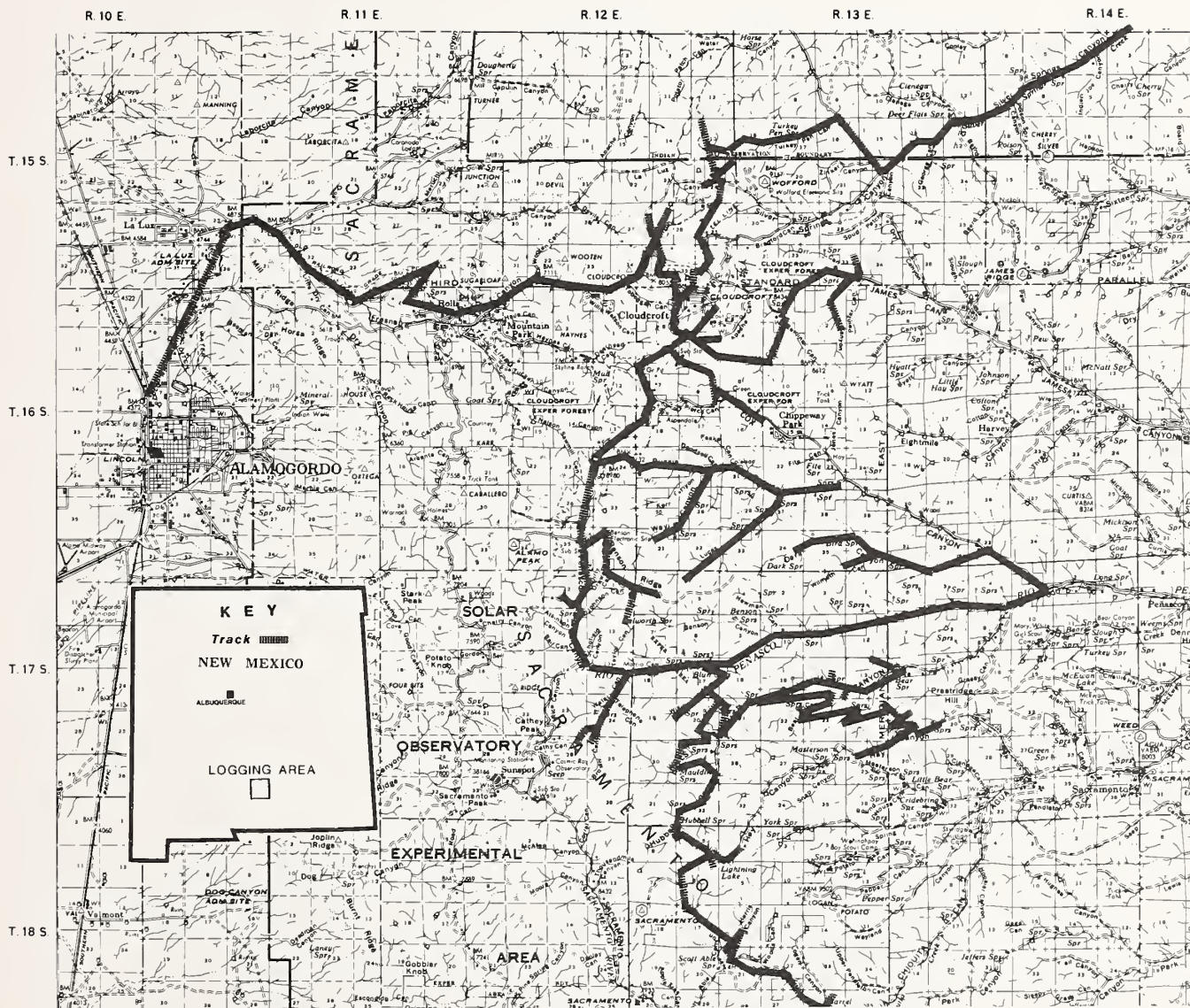
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A schematic representation of the total railsystem in the Lincoln National Forest's Sacramento Mountains.

